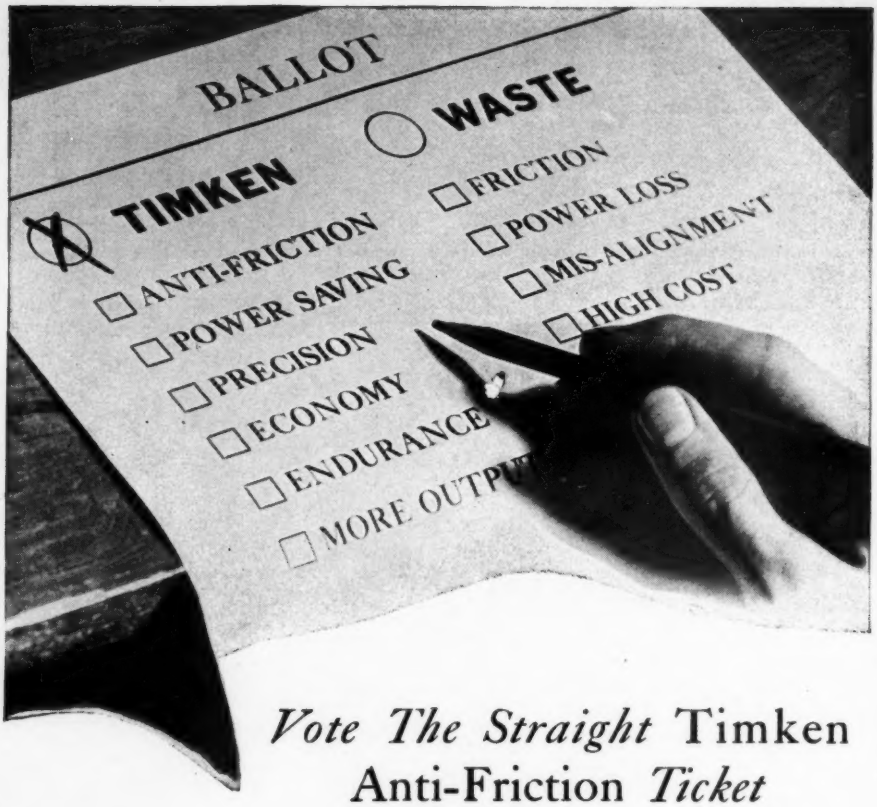
Better Crops with PLANT FOOD

October 1928 10 Cents



Vote The Straight Timken Anti-Friction *Ticket*

Support the platform based squarely upon these sound planks—Anti-Friction, Power Saving, Precision, Economy, Endurance, and More Output.

All Agriculture is interested in placing Timken Bearings in tractors, trailers, automobiles, trucks, harvesters, combines, corn shellers, feed grinders, threshers, mowers, plows, and all farm machinery—wherever wheels and shafts turn.

Timken electric steel, Timken tapered construction and Timken *POSITIVELY ALIGNED ROLLS* act as a continual pledge of permanency.

This exclusive combination is well qualified to bring down maintenance cost, slow up depreciation, increase precision, save power, increase production, and cope with thrust-radial load and shock from any and all directions.

THE TIMKEN ROLLER BEARING CO., CANTON, O.

TIMKEN *Tapered Roller* **BEARINGS**

Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*

Editorial Offices: 19 West 44th Street, New York

VOLUME XI NUMBER FOUR

TABLE OF CONTENTS, OCTOBER, 1928

Indian Summer 3
When Summer Dons Winter's War-paint, by Jeff McDermid

Farm Demonstrations 5
Taking Tests to the Farmer, by G. E. Langdon

New Hampshire 9
Another Station Story, by Henry Bailey Stevens

Dry Land Farming 13
The Semi-arid Soils of the Northwest, by F. L. Ballard

Stealing Northern Honors 17
A Southern Potato Grower, by R. B. Fairbanks

Seeding by Airplane 19
Agriculture Takes to the Air, by William L. Teutsch

Corn-stalk Shows Starvation Signs 20
An Interesting Picture Story

A Grad Makes Good 22
A College-bred Farmer, by A. E. Wilkinson

Business Interpretation of Fertilizer Experiments 25
Reckoning Profits, by John P. Bell

The Annual Corn Show 27
Making it Worth While, by G. L. Schuster

Machines Aid Harvest 29
Saving Expensive Hands, by U. V. Wilcox

Agricultural and Scientific Bureau
N. V. POTASH EXPORT MY.
of Amsterdam, Holland
Directors: J. N. HARPER G. J. CALLISTER

Better Crops with PLANT FOOD

PUBLISHED MONTHLY BY THE BETTER CROPS PUBLISHING CORPORATION, 19 WEST 44TH STREET, NEW YORK. SUBSCRIPTION, $1.00 PER YEAR; 10c PER COPY. COPYRIGHT, 1928, BY THE BETTER CROPS PUBLISHING CORPORATION, NEW YORK.

VOL. XI NEW YORK, OCTOBER, 1928 No. 4

Look into the autumn
hazes with Jeff

Indian Summer

By Jeff McDermid

INDIAN summer to many of us pessimists means a periodic interval of grace between hay fever sneezing and bronchial coughing; between sun scald and chilblains; or an interlude between the ice man's sloppy tracks and the coal man's grime.

To the optimist who never heeds the admonition of the grasshopper and the bee in old McGuffey's readers, but who dreams and dallies in real un-American fashion, as a free thinker should, Indian summer is an idyl. To thoroughly enjoy an idyl one must be idle, albeit the standardized vacation weeks by this time are torn off the calendar.

The recurrence of spring fever laziness and Indian summer somnolence enhances my conviction that Darwin made a serious error. Our species were once accustomed to "hole up" or "den down" for the dormant season instead of hanging by the hocks to vegetation like Anthropoid apes. That is, we were ground hogs originally, and up to the time of the air ship age some of us had not entirely escaped being fraternally recognized as such.

The first awakening stretch and yawn of our hibernating ancestors are carried over now in the lassitude of spring fever—although I disclaim knowledge of what causes the poetic complex. Likewise, the comfortable settling down in a snug bed of dried leaves which our forbears enjoyed in

the autumn is left to us in a rudimentary way by Indian summer languor and reveries.

Even my friend the curator of the state museum cannot tell me why they call the nice autumn days after the vanishing red brothers. Maybe the color of the leaves reminds one of the war paint which the squaws got ready when the first League of Nations was suggested by the Iroquois, who were then the Tammany leaders of New York.

YET somehow the haze over the landscape in October and November suggests the smoke of many aboriginal campfires, and each year at this time a great Chicago newspaper reprints upon request the cartoon by Hoosier McCutcheon, showing the small boy's vision of a cornfield where each shock becomes an Indian tepee by the magic of a story teller's imagery. From this, and from the lines of Hoosier Riley depicting the twinkle of the frost on the rubicund shapes of the pumpkins, while the sharp tang of the breeze hastens the husking, I am firmly convinced that Indian summer is a precious fantasy belonging to us of the Middle West.

They don't recognize it in California; it is nothing in the lives of Floridans; and the sea mists of the Atlantic are different than the indefinable diffused aura that now spreads over our inland empire.

'Tis a kind of doxology after the delights of summer, a sharp taking in of the breath before the plunge into the zero waters of winter. It stands true to the warning of wiseacres anent fine days being "weather breeders." It is the time to ramble in shaggy byways for wild grapes, bitter sweet, and hickory nuts, and to return with stone bruises, torn shirts, and burdock burrs in your pants.

The youth of the present age get their nuts from the chain stores. We used to risk our hides and re-blister our reputations every autumn by a jaunt into the blue hills for purposes of pillage.

We knew that trespass was unlawful, but the gang was in league with the squirrels and the world was ours! We had nimble legs and were used to being called so-and-so. The only unfavorable reaction to this sport was when some farmer slyly watched us from a secret place while we pelted his trees, and then invited us in to supper because his boys were all gone and he was lonesome. He was the man who first made me understand that Indian summer had sadness in it somehow, and I went home without taking any butternuts from *his* place. Thus a little poetry can become a protection against pilfering, whereas your decisive "no hunting" signs are always full of BB shot!

Coming home one night lately I chanced quite unexpectedly upon a scene that was characteristic of the nineties, when the fall days on the farm meant the laying in of a score of liniments, hair tonics, ague bitters, and fever pills. It was the sight of a flamboyant medicine show parked in the dusky fringes of a grove, with the usual eager crowd of urchins pressing to the front for favors. They had collected a crowd from the countryside of Pumpkin Hollow to revel in the peripatetic wonders of a cross-eyed juggler beneath flickering oil lamps.

SINCE treasury agents, inspectors, and bureaucratic control have paternalized us into a standardized citizenry, we have lost much of the joy that comes from being genuinely and thoroughly humbugged — completely hornswoggled out of cash that at this season was dedicated to mittens and leggings. Old Simon Surpress has taken a lot of real fun out of following the gipsies and gaping at the medicine fakirs.

But rest assured, as soon as I saw

(*Turn to Page* 62)

These seedings were the same—a mixture of timothy and clover. The plot which received 400 lbs. of superphosphate and 100 lbs. muriate of potash produced 6,432 lbs. of hay per acre (all clover); the other plot, 1,440 lbs. (half timothy).

Farm Demonstrations

By G. E. Langdon

Wisconsin College of Agriculture

TAKING the demonstration to the farmer instead of the farmer to the demonstration is a successful way of studying soil fertility problems, according to Wisconsin county agents.

In Monroe county this past year a campaign was started with 10 one-day institutes at which soils problems were discussed. About 150 farmers sent in soil samples and information blanks before the cropping season. The samples were tested for acidity and available plant food and suggestions offered as to suitable crops. While the spring field work was in progress, either the county agent or a representative from the College of Agriculture visited each of the farms, answered questions, and helped plan field work.

"The increased use of commercial fertilizers was one of the measures of success in this campaign," according to O. R. Zeasman, Soils Specialist of the College, one of the men in charge of this kind of extension work. "In 1926 only 80 tons were used in Monroe county but in 1927 more than 280 tons were used."

Potash Needed

"The work done on the silt loam soils of Monroe county uniformly shows the need for lime and phosphates. On the sand and marsh soils the problem is more complex. The sands are low in lime and all the plant foods. The solution is to use lime and the necessary mineral fertilizers for growing legume hay crops of greater feeding value and for building up the organic matter and nitrogen in the soil.

"The demonstrations disclose that

on about three-fourths of the farms potash is the limiting factor while on the other one-fourth phosphates alone give the greater response. In nearly all cases a combination of the two mineral fertilizers give the best results. No blanket recommendation can be given as the solution, but if fertilizer is to be used on an untested farm the only safe procedure is to use both potash and phosphate. For most economic use the proportions will vary."

Farm demonstrations, in Zeasman's belief, are doubly beneficial in that they show not only the benefits of fertilizers but also are a means of securing data on fertilizer needs of the soils in different localities. He feels that mere talk will not sell the fertilizer idea to the farmer unless at least some of the actual results are shown on local farms.

"One of the conspicuous things we noticed in our farm demonstrations," explained Zeasman, "is the variableness in the results which come from differences in management. One farm would show a greater response to phosphate fertilizers and the next to potash fertilizers; that is, differences in management have resulted in erratic differences in the fertility of the soils. We do not make any blanket recommendation for phosphate alone or potash alone. Except where the land has been heavily manured recently, the combination of the two fertilizers has shown a good profit, and any general recommendations, if made at this stage should be for using both fertilizers."

In Adams county, in the sand-marsh region of central Wisconsin, intensive fertilizer demonstrations also are being carried on, and the results studied by local farmers as brought to their attention by specialists and county agents in tours and field meetings.

Some of the following interesting results have been attained in special work in field demonstrations in Wisconsin according to Zeasman.

Cucumbers Respond

Plots of cucumbers were fertilized with a mixture of about 50 pounds of ammonium sulphate, 75 pounds of treble superphosphate, and 75 pounds of muriate of potash per acre which was spread around the hills. The harvest was made by the owner and the fertilizer bags tagged. The first half dozen pickings alone paid for the fertilizer used. Other plots fertilized with a mixture of 40 pounds ammonium sulfate, 60 pounds treble superphosphate and 40 pounds of muriate of potash, showed net profits of over $55 an acre.

On this farm the average yield of oats on peat where fertilizer was used is more than 51 bushels for five years.

On one plot grubs destroyed the cucumber plants on the unfertilized portion but left a 75 per cent stand on the fertilized part of the field.

Potash has been proved effective for pastures. An extensive set of fertilizer plots

was laid out in Adams county in 1925 on Dunning sand which is an extensive marsh border soil, the Wisconsin specialists report. This area was laid out in two fields; one was left in the native state and the other plowed. The seed bed was prepared and seeded to a mixture of pasture grasses. One-half of each field was limed and strips of potash, phosphate, combination (mixture of potash and phosphate), and manure were applied alike on the limed and unlimed portions of the fields. On the plowed and seeded field, much better and more grass grew on the manured plots and those having potash treatment than on the blanks and the plots having phosphate alone. Lime alone was no improvement, but with potash and with manure there seemed to be some improvement over these fertilizers alone. The combination of lime, potash and phosphate appeared to be the best plot. The lime and potash combination was second best. Potash alone showed the biggest improvement of a single element. The stock showed a decided preference for the grass growing on all plots on which potash was used by grazing them down more closely than the others.

166¾ bushels. 128 bushels. 45½ bushels.

Grains on Peat

"Peat soils are not well adapted to growing grains because of the tendency to lodge," explains Zeasman. "Proper fertilization reduces this tendency and increases the yields. On the Juneau county poor farm, oats were grown on a fertilizer plot on which potatoes were grown in 1925. The yields of potatoes showed a very excellent profit over the cost of fertilizers. The increase when 200 pounds muriate of potash and 125 pounds treble superphosphate were used was .22 tons per acre weight of straw and 49.6 bushels weight of grain per acre.

"Buckwheat was grown on a fertilizer plot on peat on the farm of C. P. Des Bouillons a short distance from Wisconsin Rapids with the following results: 200 pounds muriate of potash alone showed 375 pounds increase per acre over the non-treated plot; 150 pounds of treble superphosphate showed a 125 pounds per acre increase; and 200 pounds muriate of potash and 150 pounds of treble superphosphate showed 500 pounds increase per acre.

"On this farm the average yield of oats on peat where fertilizer was used is more than 51 bushels for five years. On the Juneau county poor farm the two-year average is nearly 60 bushels. These yields are much better than the average for surrounding sands.

Rye is a good grain crop for peat soils, according to Zeasman, and is valuable for subduing raw peat marshes. However, it pays to fertilize even when rye is grown on virgin peat. One fertilizer plot was put in and harvested in the Leola district of Adams county with the following results:

Fertilizer treatment	*Yield of Straw* pounds	*Yield of Grain* bushels
Check	2,300	11.6
150 pounds treble superphosphate	3,500	16.6
200 pounds muriate of potash	3,700	21.6
150 pounds treble superphosphate & 200 pounds muriate of potash	4,000	23.3

Potatoes on Peat Marshes

Peat is a soil physically well adapted to growing potatoes but to secure profitable yields fertilizer treatment is necessary. To demonstrate this fact, Wisconsin extension workers laid out seven plots, varying in detail, in drained marshes in Juneau and Portage counties. The results are given in the following statement.

Treatment	No. Cases	Bushels Av. Yield Market	Bushels Small	Cost Fertilizer	Value of increase over cost of fertilizer. Potatoes $1.25 a bu.
Blank	7	35.3	17.7		
100-220 pounds KCl	7	94.8	15.4	$ 4.32	$ 70.05
Blank	2	49.3	11.6		
6-12 loads manure	2	123.3	10.0	22.50	70.00
Blank	1	42.6	9.3		
100 pounds KCl and manure	1	155.8	7.9	20.75	120.75
Blank	1	0.0	32.0		
275 pounds 0-12-12	1	72.0	29.3	5.50	84.50
Blank	1	74.5			
125 pounds treble superphosphate	1	104.0		3.44	33.43
Blank	2	37.2	32.0		
200 pounds KCl-75 pounds 125 pounds treble superphosphate	2*	98.6	34.6	7.75	69.00

(*Each plot had 200 pounds KCl and in addition one had 75 pounds treble superphosphate and the other had 125 pounds treble superphosphate. One of the plots had poor drainage.)

The primary need is potash; and there is less response to phosphate. Manure alone does well, but manure reinforced with potash salts gives the best results. During this particular season of high-priced potatoes, the use of fertilizer was very profitable. The yields on the blank plots were so low that it proved extremely unprofitable to attempt to raise potatoes on this soil without fertilization.

Potatoes on Sand

Potatoes have always been a favorite cash crop in the sand section of Wisconsin, and are one of the crops responsible for the depletion of fertility in this section. Usually manure only has been used by farmers for fertilizing them; but in these experiments it has been found that commercial fertilizers properly used increase the yields and replace some of the plant food sold in the crops.

Eleven fertilizer plots on potatoes were harvested. The fertilizers used were 4-8-8 and home-made mixtures of ammonium sulphate, treble superphosphate, and muriate of potash used in about the same proportion. The amounts ranged from the equivalent of 225 to 700 pounds of 4-8-8 fertilizer, the average being about 500 pounds. The average yield on 11 check plots was 104.4 bushels and the average yield on 11 plots using all

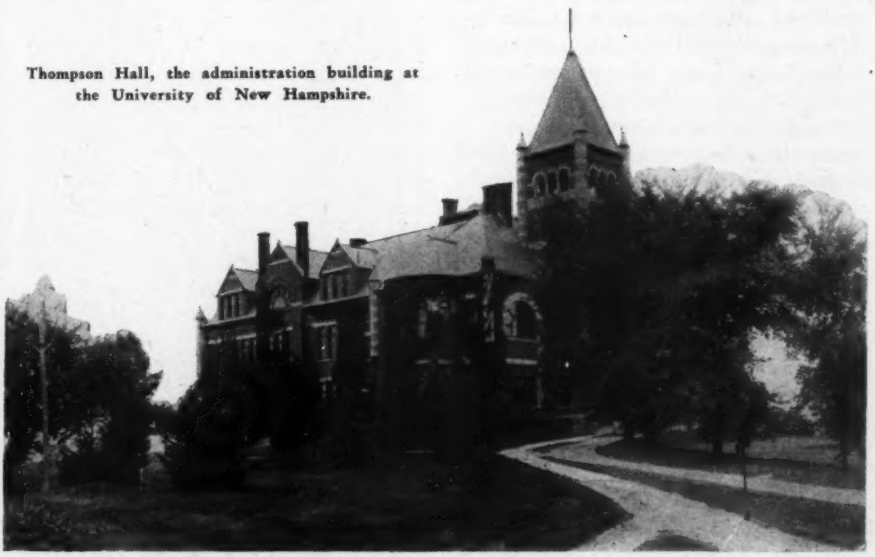
(*Turn to Page* 54)

New Hampshire
Experiment Station

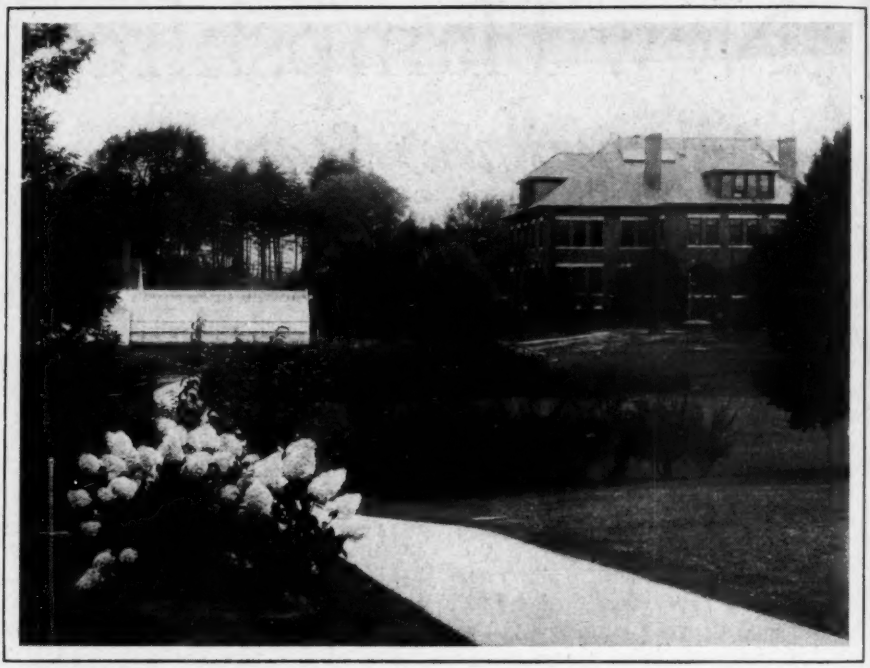
By Henry Bailey Stevens
New Hampshire Agricultural Experiment Station

IT is now nearly 300 years since white men started to develop agriculture in New Hampshire. As early as 1634 a letter to Capt. John Mason of England from Mr. Ambrose Gibbons, manager of his plantation at Newitchawanock near the present city of Portsmouth, said: "you have here at the great house 9 Cowes, 1 Bull, 4 calves of the last year and 9 of this yeare, they prove very well, farre better than ever was expected. They are as good as your ordinary Cattle in England and they goates prove some of them very well, both for milke and breed. If you did send a shippe for the Western Ilands of 6 scoore tunne or thereabouts for cowes & goates it would be profitable for you. A good husband with his wife to tend the Cattle & to make butter and cheese will be profitable, for maides they are soone goune in this countrie."

Even since then, except in the industrial centers, farming has been a major industry in New Hampshire. Although the Agricultural Experiment Station was not established until August 4, 1887, it is interesting to note that long before this time Benjamin Thompson, the Durham farmer who was responsible for its foundation at the present site, had a vision of the possibilities of agricultural education and research. Even before the passage of the Morrill Act by Congress, Mr. Thompson had drawn up his will leaving to the agricultural college his entire estate. Upon his death in 1890 this bequest led to the removal of the institution from Han-



Thompson Hall, the administration building at the University of New Hampshire.



Morrill Hall, agricultural building and headquarters of the New Hampshire Experiment Station.

over where it had been established as a part of Dartmouth College to its present location in Durham.

It was only natural that the first experimental work of this station should have been concerned with problems affecting dairy production. The progeny of Capt. Mason's cattle, "very Large Beasts of a yellowish colour," are said to have been scattered through northern New England, and since that time cows have played a considerable part in the state's farming operations. Kept at first to supply local demands for milk, cheese, and butter, they began to furnish milk for the industrial centers at an early date. The first milk was sent to Boston on steam cars in 1845; and while the numbers of sheep, swine, and beef cattle have steadily decreased since that date, the population of dairy cattle has held its own.

The first director of the New Hampshire Station, George H. Whitcher, dealt in his early reports with work on ensilage, feeding experiments, winter cut corn ensilage, science and practice of stock breeding, fertilizer and fertilizer material, tests of dairy apparatus, effect of food upon milk, etc.

As far as agronomic experiments were concerned, the removal of the Station to Durham in 1893 was perhaps unfortunate since the heavy soil there has not been representative of conditions in general throughout the state. Life history studies of many insect pests, investigations of plant diseases, tests of varieties of horticultural plants and analyses of fertilizers, feedstuffs, and soils played an important part in the work of the Station in the years around the turn of the century.

From 1894 until 1901 Charles S. Murkland, president of the college was acting director of the Station. In 1902 W. D. Gibbs was made director becoming president as well the following year. In 1908 the investigational work was placed in charge of the entomologist, E. Dwight Sanderson.

Upon his resignation in 1910 the present director, John C. Kendall, who is also in charge of the University Extension Service, was appointed.

Among the major projects in recent years have been the studies in sheep breeding, basal metabolism of steers, fruit bud formation, effect of insecticides and fungicides upon plants, life history studies of codling moth, European corn borer, gipsy moth, brown tail moth and many other pests. With the passage of the Purnell Fund it has been possible to start a comprehensive series of soil fertility experiments in the different parts of the state. Investigations in agricultural economics, home economics, and poultry diseases are also now under way for the first time.

The station is cooperating with the nutrition laboratory of the Carnegie Institution of Washington in nutrition studies with steers and dairy cows. One of the features of this work has been the use of a new type of respiration chamber, the first inexpensive type of respiration chamber for large domestic animals in the world. Work in this field has now been conducted for 10 years in Durham.

John C. Kendall, director of the experiment station and extension service.

During the past three years the New Hampshire Station has been conducting studies in the relation of electricity to agriculture for the New England area in cooperation with the state and national committees on this subject.

Horticultural Experiments

One of the major projects of the Station has been that of fruit bud formation. For 18 years the Station has been securing records from the Woodman orchard on trees growing under various cultural conditions: trees in sod with no fertilizer, unfertilized trees cultivated in alternate years, trees cultivated but not fertilized, trees cultivated which receive in addition 2 pounds nitrate of soda, 4 pounds sulphate of potash, and 8½ pounds superphosphate or its equivalent in basic slag per tree, and trees which receive in addition to the cultivation and complete fertilizer listed an additional amount of superphosphate in the one case, nitrate of soda in another, and sulphate of potash in the third.

During the first 10 years of the experiment some increased growth on the plots receiving fertilizer was indicated but no significant increase in the average annual yield. During the last eight years, however, the yield of the trees has been very materially influenced by the fertilizer treatments. There are apparently four general classes in order of yield as follows beginning with the lowest: (1) trees growing in sod without fertilizer; (2) trees cultivated without fertilizer; (3) trees cultivated and receiving either the complete fertilizer alone or with extra phosphorus and potash; (4) trees cultivated with complete fertilizer and 4 pounds of extra nitrate of soda per tree.

The trees in the plot receiving cultivation and cover crop together with the application of six pounds nitrate of soda and other chemical fertilizers

have become the most vigorous in the orchard. Instead of declining in yield they show an increase on the average for 1919-1925 of nearly 75 per cent over their production for the preceding 10 years, 1909-1918 inclusive. These trees are resisting winter injury and the inroads of canker more successfully than the others in the orchard.

For nine years a series of top-dressing experiments was conducted on hay plots. Sixteen plots without fertilizer gave an average yield of 1½ tons of hay, while the application of 200 pounds of nitrate of soda increased this figure by ½ ton, and 400 pounds of nitrate gave a ton increase. Other fertilizer treatments gave similar increases.

Analyses of the heavy clay soil at Durham have shown that large amounts of potassium oxide are present, and studies of hay on this type of soil have indicated that sufficient potash was available from this source. Studies with potatoes on this soil have also shown that where stable manure was used at the rate of 20 spreader loads per acre the strength of potash in the supplementary fertilizer need not be greater than 4 per cent. On the other hand in the soil fertility plots established in Greenland since 1925 the only significant increase in alfalfa yields has been in the potash plots. It is too early as yet to draw very general conclusions for the state as a whole, but the series of soil fertility plots in the different parts of the state which are now established should give important information during the next few years.

Garden Plots

Permanent garden soil fertility plots have now been established for ten years receiving the following treatments each year:

Plot 1—32 tons of manure per acre.

Plot 2—24 tons of manure per acre and the following commercial fertilizers per acre: 150 pounds Tankage, 100 pounds Nitrate of Soda, 600 pounds Superphosphate, 150 pounds Muriate of Potash.

Plot 3—Green manure plus the following commercial fertilizers per acre: 160 pounds Nitrate of Soda, 250 pounds Tankage, 800 pounds Superphosphate, 300 pounds Muriate of Potash.

Plot 4—16 tons of manure and the same fertilizer treatment as Plot 3.

Plot 5—Check plot.

Plot 6—8 tons of manure and the same fertilizer treatment as Plot 3.

Plot 7—Green manure plot.

In general the response from manure has been most noticeable with the different crops. This was true with red kidney beans, sweet corn, snap beans, and strawberries. Blue Hubbard squash responded remarkably to applications of readily available plant food either in the form of stable manure or stable manure with supplementary commercial fertilizers. Plot 6 yielded approximately as Plot 1. Yields of spinach indicated that commercial fertilizer could be substituted for stable manure to a considerable extent. One half of each plot is limed each second year with 2,000 pounds of ground limestone. The investigations showed that lime effected a 75 per cent increase in spinach.

Where the tomato season is cut short by early frost as in New Hampshire the use of superphosphate in addition to manure has been found to increase very greatly the total crop of ripe fruit obtained. Studies for several years on the effect of phosphorus on the tomato showed that the maturity of the tomato crop was hastened by the use of this fertilizer, by promoting the rapid early growth of the plant.

Recent economic studies have disclosed facts which may have an important bearing upon the future agricultural development of the state. The state wide survey of the economic balance between the production and consumption of food stuffs grown in the

(*Turn to Page* 58)

A large combine at work in Umatilla county, Oregon.

Dry Land Farming

By F. L. Ballard

County Agent Leader, Oregon Agricultural College

WHEAT production under dry farm practices is one of the important agricultural enterprises out in the Northwestern country. West of the Great Plains regions and north of the line drawn through Utah and crossing Nevada at about Reno and on through California, the practices of dry land farming are generally similar and differ from practices of the Great Plains regions. In this western region the precipitation is practically all received in fall and winter, and moisture conserving practices are so organized as to make this winter moisture carry on to the utmost possible degree through the growing months of spring and early summer. Very satisfactory dry land farming in these regions is conducted on 10 to 12 inches of rainfall and some of the most famous wheat land of the country is farmed under an average precipitation of 18 to 22 inches.

Big scale operations are the practice in farming under these dry land conditions. Extensive areas are farmed in the single farm unit. A section of land is a rather small wheat farm. Two sections are approaching a real unit, while many of them run into the thousands of acres. All other things being equal, the larger holdings are the most practicable, owing to a certain standardization in practices which can be so handled as to reduce overhead. There is in active operation a well developed trend toward enlargements of units. A Government survey of income and expenses from 79 such farms in Oregon bears out the soundness of this trend. On the farms of 1,000 acres or more,

the gross income was larger; likewise, the net income. Based on trends in interest on capitalization, the farms of 1,000 acres or more return more than twice the return of those of 500 and 600 acres. Bigness prevails in all the different farming operations. Hitches of 32 horses or mules on the combine which cuts and threshes the grain and hitches of 8 to 20 horses or mules on harrows or weeders are common, while the wheat hauling is done with 8 and 10 animal hitches.

In the after-war developments, however, this movement stopped and probably receded somewhat as throughout most of this region a generally heavy stocking of horses and mules is necessary for some of the operations. It generally was found most economical to use horses and mules, raising some increase on the ranch. Now with different conditions and later improvements in machinery, there is again quickened interest in motorized outfits. Careful consideration is being given to the conditions under which such machinery is an aid to economical operation.

Many of the changes directly point toward cost reduction. An important change in this connection has been the abandonment of many of the large 32-horse combines in favor of the smaller combines pulled by 10 or 12 horses and operated by two men. Adoption of the small combine lengthened the harvest season on the individual ranch, but reduced the labor requirements so materially that the economy is becoming very rapidly established. Larger hitches for harrowing and weeding were adopted.

Summer Fallowing

Trends in the dry land regions are, of course, toward increased yield per acre, but it has also been found of economic importance to increase the acreage farmed per man by use of these improved mechanical devices. In this connection there is a growing tendency to increase the plowing hitch, for instance, from an 8 to 10-horse team pulling a 14-inch three bottom gang plow to a 16 to 20-horse team pulling two such plows, but, of course, with only one driver; in fact, the 16-mule team is generally popular as this hitch will handle 12-foot duckfoot cultivators or two 12-foot revolving-rod weeders.

The basis of dry land tillage practices in this Northwestern region is summer fallow under which the land lies fallow every other year, or every second year. This practice was established as a moisture conserving factor, two years' moisture being available,

Wheat stacked up awaiting shipment at a warehouse in eastern Oregon.

A Palouse homestead where wheat has been the only crop for 40 years.

therefore, for a single crop. Recent investigational work in dry land farming shows, however, that where rainfall exceeds a certain volume, the summer fallow in reality has no effect on moisture conservation, but does have a vital effect upon the accumulation of nitrates in the soil. Where the rainfall is very light, the summer fallow practice does have beneficial effect upon holding moisture.

Incidentally, out on these big wheat farms the continuous cropping of the thousands of acres of semi-arid land has for some years now foretold a pressing problem. What will happen when the soil becomes depleted, has been the question. One answer has been, why worry? The crops are greater now than 15 and 20 years ago. This is true, but this condition has resulted from improved varieties and improved knowledge of the handling of dry land soils is the reply.

The more far-sighted farmers point to the increasing erosion on the hills of the Palouse country in eastern Washington and northern Idaho, and to other signs of diminished fertility and impaired physical condition of the soil. The question of soil depletion on these thousands of acres is, in fact, already a serious one. In the Palouse country, with its relatively higher rainfall, a legume crop has been successfully established in the grain rotation with results that will be elaborated upon later in this article. On other soils in eastern Washington, in Utah, and in the Columbia Basin in Oregon in particular, where the rainfall is around 10 to 12 inches, the problem is more difficult because here it now appears that wheat is the only possible crop of commercial importance after all efforts to include a legume on a practicable basis have met with poor success.

Some unusually competent research work in dry land practices has been carried on by experiment stations in the Northwest, and it is interesting that at widely separated points in this region similar tillage practices have produced comparable results. As an example, at Moro, Oregon, Lind, Washington, and Nephi, Utah, the latter an elevation of 5,000 feet, it has been found that the fall disking of stubble land to be plowed early in the spring decreased yields. This was formerly an advocated practice that was extensively followed. Now it is generally being abandoned. Highest yields of winter wheat in all three districts were harvested from land that had been plowed for fallow in early spring. Results covering a 15-year period in Oregon indicate a loss of a bushel per acre per week for each week land is left unplowed after the middle of April.

Another common practice in the wheat country a few years ago was the

Discing with eight-horse or mule teams.

spring harrowing of winter wheat, a rather expensive operation when the large acreages in the dry land wheat ranches are considered. Several years' results at Moro and Lind indicate slightly reduced yields where this practice is followed, and at Nephi no increased yield resulted. In all three districts highest yields were obtained from early fall seeding of wheat providing the ground had been moistened by fall rains.

In the regions of heaviest rainfall in the Northwest dry farm country, the practice of burning stubble is generally followed. Results on the farms so far indicate that this practice, commonly thought to be wasteful of soil organic matter, is the practicable one, inasmuch as heavy volumes of stubble do not decay rapidly in dry farm soils and cause excessive drying out and consequent reduction in yield.

In the Palouse country of eastern Washington and northern Idaho, soil analyses show that 40 years of summer fallow tillage have resulted in a loss of one-third the organic matter of the soil. Here soil erosion is becoming pronounced. In this region the annual precipitation is about 20 inches per year, and under these conditions it is becoming evident that summer fallowing is not a necessity for moisture conservation, i. e., to store two years' moisture for one crop. A normal annual rainfall brings the first seven feet of soil up to its full moisture-holding capacity, which is enough moisture for a 50-bushel wheat crop, a heavier yield than is usually produced even under the best methods. It is under such conditions as this that the benefits of summer fallowing lie in the accumulation of nitrates. The question immediately arises, cannot these nitrates be applied artificially, or, better yet, by use of leguminous crops? Both methods are being followed, but the growing of leguminous crops has made the most rapid advance under practical farm conditions. Sweet clover is making rapid advance in this region as a pasture crop, making possible the carrying of livestock in considerable numbers on farms heretofore exclusively devoted to wheat production.

Rotation

In general, however, in deciding upon other crops to be grown in a rotation in the wheat country, the influence of these crops on the yield of wheat is the most important factor as wheat still is, and will continue to be, perhaps for all time, the most important crop. In this connection, sweet clover, alfalfa, and red clover, all have a pronounced beneficial effect upon the succeeding yield of wheat. Sweet clover and red clover show best results on the wheat crop the first year after their elimination, while the effects from alfalfa are best on the second wheat crop and the

(*Turn to Page* 61)

Allen J. Ellender is the Louisiana "Potato King"

Stealing Northern Honors

By R. B. Fairbanks

SOUTHERN Louisiana is noted for her early Triumph Irish potato crop. About 10 years ago this industry in Louisiana was practically annihilated by diseases. The yields were so small and the tubers that were produced were so inferior because of disease, that the cost of production was far more than the price received. In fact, the industry had literally received a knockout blow. About this time George L. Tiebout, Horticulturist of the Louisiana Extension Service, started some tests with certified Triumph seed from the West. It very quickly was proven from the use of these certified seed that sufficiently good quality potatoes and high yields could be secured to make the business profitable again. Since that time the early Triumph Irish potato industry in Louisiana has been on the up-grade and is now bigger than it ever has been in the past.

Many of the parishes in the southern part of the state grow the early Irish potato very extensively. Probably none of these produce better potatoes or produce them more profitably than the Terrebonne parish. The soil is rich, has enough fall so that reasonably good drainage can be provided and is of a texture that makes it especially adapted to the successful growth of this crop.

One of the leading growers of Terrebonne parish is Allen J. Ellender. This year he was crowned "Potato King" in a contest put on in the State by the Extension Service and others. He has secured as high as 341 bushels per acre and this year (1928) his average for his entire crop was 242.42 bushels per acre of graded potatoes. This quantity was produced after 15 to 20 bushels per acre were eliminated because of scab and other reasons.

Allen J. Ellender.

But let Mr. Ellender tell his story in his own words. How he produced this crop is intensely interesting, and he tells it in the following paragraphs in a most practical and helpful manner. Here is what he says:

"I am very much gratified with the showing made with my spring potato

crop, especially because I was again able to improve my yield over previous years. My yield the first year, per acre, was about on a parity with the average yield for the State, say 60 to 75 bushels. In the space of five years, I have gradually increased that yield to as high as 341 bushels per acre, with an average for my entire crop this year (1928) of 242.42 bushels per acre, of graded potatoes. I had an unusual amount of cut, scab, and deformed potatoes this year, which decreased my yield at least 15 to 20 bushels per acre.

Intensive Methods

"Three of my tenants entered a three-acre contest conducted by the Agricultural Department and Extension Division. The average yield for the nine acres was a little over 270 bushels per acre of graded potatoes. It does seem as if we are going to win three of the four prizes offered.

"My motto is 'intensive,' instead of 'extensive' farming. Each of my tenants is allotted from 9 to 15 acres of ground, 4 to 8 acres of which are planted each year to potatoes, and the rest soybeans, corn, string beans, and other vegetable crops. Following my potato crop the land is planted to soybeans, sweet potatoes, and corn. By permitting my tenants to cultivate a small acreage, the land can be better prepared, the soil can be better cultivated, and they are able to cope with the weeds and grass to advantage.

"I consider drainage one of the most important steps in potato culture. A seedbed cannot be thoroughly prepared unless the land is properly drained. Soggy, sour, wet lands will not do when preparing the seedbed, and a lack of drainage will cause such a condition. Many feel that mere surface drainage is sufficient. That is a mistake. Lateral ditches, 18 to 30 inches deep should be made, paralleling the potato rows, every 150 to 200 feet apart, depending on the distance the water must be carried to the main drainage canal. Such ditches, by small drains leading into them, will not only take care of surface drainage, but also seepage drainage. A farmer who takes care of his seepage has a decided advantage in that he can cultivate and work his land much sooner after a rain.

"The next step is to add humus to the soil and that may be accomplished by plowing under a heavy crop of soy or velvet beans. I always follow my potato, bean, or other vegetable crops with a crop of soy or velvet beans. About the latter part of September or early October, I plow the soy or velvet beans under, taking precautions that they are well covered. Later on, say about four or five weeks thereafter, I pass a disk harrow or disk cultivator over each row so as to kill all grass or weeds that may come up during the fall. In the latter part of December or the early part of January, I plow my land for a second time. By so plowing, the decayed soy and velvet beans become thoroughly mixed with the soil and an excellent seedbed for my potato planting is the result.

"I used a commercial fertilizer analyzing 10-4-7 (P.N.K.). It was applied at the rate of 600 to 650 pounds per acre at planting, care being taken that the fertilizer did not come in contact with the seed piece. When the potatoes were out of the ground to a height of three to four inches, I applied a side-dressing of nitrate of soda, at the rate of from 150 to 200 pounds to the acre. I believe that better results could have been obtained had I applied the commercial fertilizer about 15 to 20 days before planting.

"After the land is thoroughly prepared and fertilized, then comes the important step, that is, planting. Good seed selection is as important a cog in the process of potato culture as is any other step. I have used Nebraska Certified Triumphs for the past five years with most excellent results. I

(*Turn to Page 59*)

Seeding *by* Airplane

By William L. Teutsch

Oregon Agricultural College

THE airplane is proving to be of new usefulness in the field of agriculture. In numerous instances airplane dusting of vegetable and fruit crops for the control of insect pests has proved successful. Now comes Harold R. Adams and his partner, N. W. Perkins, commercial fliers at Myrtle Point, Coos county, Oregon, who used their travel-air biplane to broadcast grass seed on a 1,000-acre tract of range land to be used for grazing sheep.

As a result of this successful feat, it is believed a world's record has been set in speed of seeding grass lands. The entire 1,000 acres were seeded in slightly more than 10 hours; thus, the seeding was done at the rate of 100 acres per hour. That the experiment was successful is proved by the fact that on this 1,000-acre tract an excellent stand of grass is now evident.

The idea was conceived by Dr. Earl G. Lowe, a practising physician in Coquille, Oregon, and one of the stockholders in the Coquille Valley Sheep and Wool Company, owners of 800 ewes.

The interesting part about the experiment was that the cost of seeding by airplane was less than the cost of hand seeding. The seed was broadcast from the airplane at a cost of 50c per acre, while the usual contract price for hand seeding is $1.50 per acre. Experts who examined the plot also expressed the opinion that the airplane distribution of seed was more uniform than was possible from the hand broadcast.

These Oregon aviators by means of a specially constructed hopper to hold the seed in the front cockpit, the valve opening of which was controlled by the pilot in the rear cockpit, were able to do an excellent job of seeding. The opening through which the seed passed was calibrated before the plane left the ground by timing the amount of seed that poured through

(*Turn to Page* 47)

Cornstalk Shows

THE corn, growing on a black sandy loam in the plot at the right in the first picture, was fertilized with 100 lbs. of 20-20 in the row at planting time. The plants at the left received in addition a side-dressing of muriate

of potash at the rate of 400 lbs. per acre. A marked difference in growth is noticeable.

The picture in the oval is of two representative stalks taken from these plots to be used for the stalk test for malnutrition, developed by Dr.

G. N. Hoffer, Purdue University Agricultural Experiment Station, Lafayette, Ind.

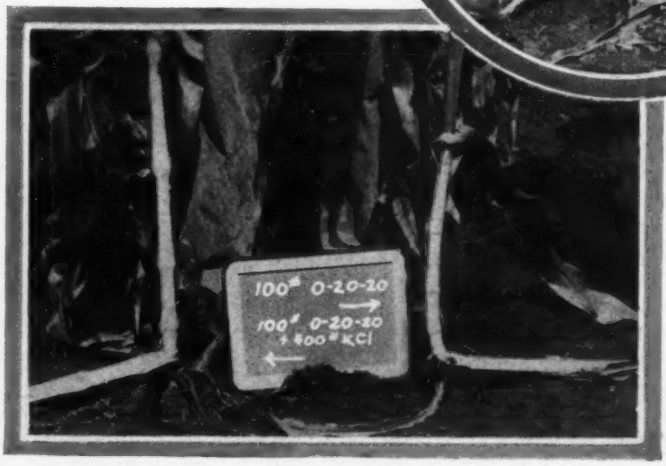
Even before the test is made, potash deficiency symptoms can be recognized readily in the field. The leaves show a marginal firing and yellow streaking, as indicated in the third picture. Plants are three to four feet tall when these symptoms develop in soils deficient in potash.

The first step in making the test is to caretully pull the stalks and examine the roots for root rot, commonly found in potash deficient soils. The stalks are then

Starvation Signs

The stalk to the right in the last picture received 20 lbs. of K_2O per acre in the row at planting time. The stalk to left received 20 lbs. of K_2O per acre at planting time and a side-dressing of 400 lbs. of K_2O per acre three weeks after planting. Note the heavy iron accumulations in the smaller stalk, split open clear through the crown, keeping all dirt from the split surfaces. (Fourth picture).

A few drops of the chemicals, more fully described in Purdue Bul. 298, are then applied to the joint tissues to see whether or not there is an accumulation of iron. (Fifth picture). An accumulation of iron shows up under application of the chemicals as a reddish discoloration in the joint tissues and indicates that the plant is not receiving enough potash.



whereas the content of iron in the larger stalk is normal. These test results show that an application of 100 lbs. of 20-20 does not supply adequate potash in this soil.

With the stalk test, deficiencies of nitrogen and phosphorus can also be determined.

Spiking the old theory that college men are not good farmers.

A Grad Makes Good

By A. E. Wilkinson

Vegetable Specialist, Connecticut Agricultural College

AT times harsh criticisms are made of agricultural college graduates due to the fact that some people believe the majority of such graduates are influenced away from actual farming and at times even those that are inclined towards farming do not obtain as big a success as their education would seem to warrant. It is a big question whether such criticism is warranted. Much difference in opinion prevails. Those that are in close touch with graduates of agricultural colleges feel that a large percentage of such graduates make good at farming. This is the belief of the writer. In order to back up this belief a story of a graduate of an agricultural college is used as an illustration. This example can be used for other men in similar circumstances.

In the little town of Buckland situated just north of Manchester, Conn., in the year of 1896 on the farm of his father was born Frank V. Williams, a rather serious minded chap who has the faculty of looking into things and grasping details. He grew up as all boys do in that location—attended the grammar school and high school and at the age of 18 decided to take a two-year short course in agriculture at the Connecticut Agricultural College, Storrs, Conn. The two-year course caused this young man to decide that if he wished to be the best type of farmer and to be above the average of farmers in whatever neighborhood he decided to live, it would be to his advantage to obtain a full college course of four years. Just as this decision was being made Frank was drafted to serve in the war.

At the end of the war he was discharged with thousands of other young men and did not immediately return to farm work. In less than two years thereafter he thought there was no future in the type of work that he was doing and in February, 1921, he decided to again enter the Connecticut Agricultural College in order to obtain the B. S. degree. He graduated with the class of 1922, being very prominent in many of the affairs which make up a successful college body.

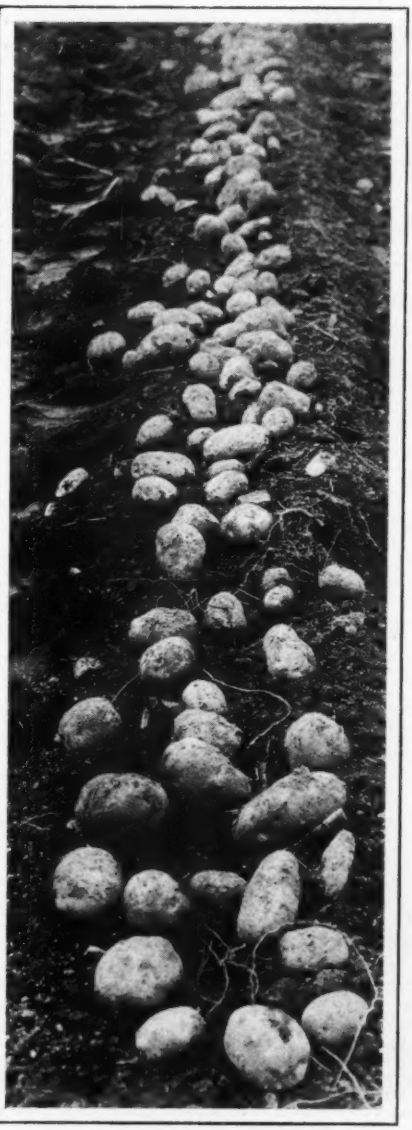
During the period of attending the college and one summer, he had the good fortune to earn some money by working for the Experiment Station and it was while working under the direction of the Experiment Station that he became interested in potato growing. Having learned what he could from the experimental and practical side of the growing of potatoes as conducted by the Experiment Station, he decided on April 1, 1923, to rent 10 acres of land from his father at Buckland, Conn. The entire acreage was to be planted with potatoes, entirely looked after by Frank, and any spare time was to be given over to assist his father in various farm work.

The methods used in 1923 were, of course, those that he had learned from the previously mentioned source. He used a home-mixed fertilizer of a

4-8-4 formula approximately 1,500 pounds being applied per acre. The variety of potatoes planted were Green Mountain, the seed being certified and obtained from a good source in Maine. The plowing work was carried on with a three-horse hitch. It required 48 hours of work to plow the 10 acres. Being familiar with machinery he used a two-man planter with a fertilizer attachment and thus the potatoes were planted quickly and more uniformly.

One of the big items in successful potato raising is that of spraying, and Frank sprayed his crop six times using a four-row 12-nozzle sprayer of the traction type. He had learned that he could save money by making his own Bordeaux mixture of 5 pounds copper sulphate, 6 pounds of lime, and 50 gallons of water. When properly mixed he found this formula made one of the best sprays for the control of blight. At harvest time the potatoes were dug with a modern digger and the crop all sold in the field at an average price of $1.70 per bushel. The yield per acre averaged 225 bushels of number ones. This gave him a return for the 10 acres of $3,825.

This yield was satisfactory enough to influence Frank to hire 12 acres in 1924 and as before assist his father with other farm work when not busy with the potatoes. The fertilizer used in 1924 was similar to that used in 1923 and the amount per acre was the same. The seed variety again was Green Mountain and was obtained from a good source in Maine. Of course it was certified. The planting, plowing, and cultivating were similar to that used in 1923 and so was the spraying with the home-mixed Bordeaux. One great change in this year was the fact that a new digger had arrived with an engine attachment which brought the crop out of the ground in much better shape.



What 500 bushels per acre look like.

The yield this year was a little higher than the year previous averaging 275 bushels per acre of number ones. These were sold at digging time for 90 cents to $1.00 per bushel.

This again encouraged Frank so much that on April 1, 1925, he obtained a five-year rental and option to buy his father's farm.

This year he decided to raise 15 acres of potatoes and in addition three acres of sweet corn for seed, the balance of the land being in hay and a few miscellaneous vegetables. There was a change in his methods during this year. He continued to home-mix his fertilizer, but instead of using a 4-8-4 formula he used a 5-8-7 formula, approximately 1,800 pounds per acre. It was thus seen that he not only used a higher grade fertilizer but more of it. This change was probably brought about due to the fact that the change was common in his neighborhood and throughout the State.

Capitalizes on Experience

The variety of seed potatoes used was again Green Mountain but instead of planting all certified seed from Maine, some of the certified seed was obtained from Vermont, so that he was in a better position to judge the merits of stock from both places. The plowing was the same as in previous years, but instead of harrowing with horses a tractor was obtained and a double-action disk used. This rendered the land in finer and deeper condition. In previous years the seed pieces were cut by hand but during this year the bulk of the seed was cut with a machine cutter. By hand from two to three bushels are generally cut in an hour and with a machine five or six bushels were cut.

A slight increase in the number of times the crop was sprayed was made this year, the same type of sprayer being used and the material being home-mixed Bordeaux. The cultivating and digging of the crop were the same as in previous years. The yield this year was more than any other year amounting to 290 to 300 bushels per acre of number ones. Practically all the crop was sold in the fall at $1.75 per bushel. Frank regretted not holding the potatoes that year because a little later they sold for $3.00 a bushel and he said he could have made considerably more money by storing, but unfortunately his facilities for storing were not large and the amount of crop obtained, almost 5,000 bushels of all kinds, was more than he could accommodate.

In 1926 the same acreage of the crops was raised as in 1925, that is, 15 acres of potatoes, three acres of sweet corn, corn for grain, and a few miscellaneous vegetables. The great changes during this year were found in a 200-pound increase per acre of fertilizer used; the same formula, 5-8-7 as used in 1925 was again used this year. The variety of potato seed was Green Mountain but all came from certified seed from Maine. The other great change was an increase of one spraying which probably due to weather conditions was necessary. The average yield this year was 300 bushels of number ones. At digging time in the fall two-thirds of the crop were sold. The balance was sold in the winter at a loss of 25 to 30 cents per bushel over the price received in the fall. Nevertheless he obtained a satisfactory

(*Turn to Page* 44)

Interested farmers watch the digging.

Business Interpretation *of* Fertilizer Experiments

By John P. Bell

University of Arkansas

THE usual method for reckoning commonly styled increased profits through the use of fertilizers may be misleading, states Dr. J. A. Dickey, Professor of Rural Economics and Sociology, College of Agriculture, University of Arkansas. This is true because of the failure to take into account the added expenses involved in harvesting the increased yield, such as horse labor, man labor, marketing, insurance, and interest.

The use of fertilizers has increased enormously. As crops rise in price, their use is certain to continue to increase. "Many farmers would make more money if they used more fertilizers, but a farmer needs to be careful about applying the results he reads about. The facts recorded as to yields may be accepted, but the conclusions as to profits are sometimes misleading, because the difference between the cost of fertilizer and the value of the increased crop is often called profit," Dickey says. He points out that all the other costs, such as interest, crop insurance, hauling and applying fertilizer, harvesting, storing, and marketing the increased crop are ignored. The primary object of such trials or tests is to determine the effect of any particular treatment. This part is usually well done and is of great value to farmers. The business interpretation of results is often poorly done.

The same point applies in the interpretation of results of any other intensive methods. Dickey goes on to say, "The statement that it costs no more to handle a large crop than a small one is almost universally accepted by persons who have never kept any accounts of such work. It has been assumed that it costs no more to grow, harvest, store, and sell 75 bushels of corn per acre than it does to raise 31 bushels. Any conclusions based on such an assumption are worse than useless. We must know the extra cost of growing and handling the larger crops before we can tell how large a crop it pays to grow. There is a limit both ways in profitable crop production.

"This method of figuring profits has come about as a result of the failure to assign any value to the farmer's time. The farmer's time is worth at least farm wages. If not, he had best hire out to a neighbor who will pay him wages. He owes no thanks to anyone who persuades him to adopt methods that do not pay farm wages.

"The almost universal method of interpreting fertilizer tests is shown by the following example taken from a very excellent publication.

"The last column 'Value of Increased Crops above Cost of Fertilizer' is called profit in this publication. The conclusion is, therefore, reached that the complete fertilizer used on plot 11 pays best. But the $19.64 is not profit. Of all the costs involved, only the cash cost of fertilizer has been subtracted from the increased value of the crop.

Results of a Fertilizer Trial

Treatment	Cost of Fertilizer	Value of Increased Crops Above Cost of Fertilizer
Plot 2, phosphorus	$2.40	$13.99
Plot 6, nitrogen and phosphorus	14.40	19.29
Plot 8, phosphorus and potassium	8.90	14.34
Plot 11, nitrogen, phosphorus, and potassium	20.90	19.64

"The fertilizer on plot 2 cost only $2.40 while that on plot 11 cost $20.90, a difference of $18.50. The increased crop on the latter plot pays this and leaves $5.65 to pay for the other extra costs. This must pay interest on $18.50, crop insurance, pay for hauling and applying the extra fertilizer, and for harvesting, storing, and marketing the increased crops of 10 bushels of corn, 15 bushels of oats, 9 bushels of wheat, and 1,785 pounds of hay. The farmer is not likely to find anyone who is willing to undertake this contract for $5.65.

Mr. Dickey gives, in the following table, an example of proper cost accounts in the use of fertilizers on a New York state farm:

"The table below gives the results from a set of cost accounts in growing 60 acres of timothy hay on a New York farm. The increased crop, due to fertilizing, was about 60 tons. The table gives a close approximation to the cost of producing this increased crop.

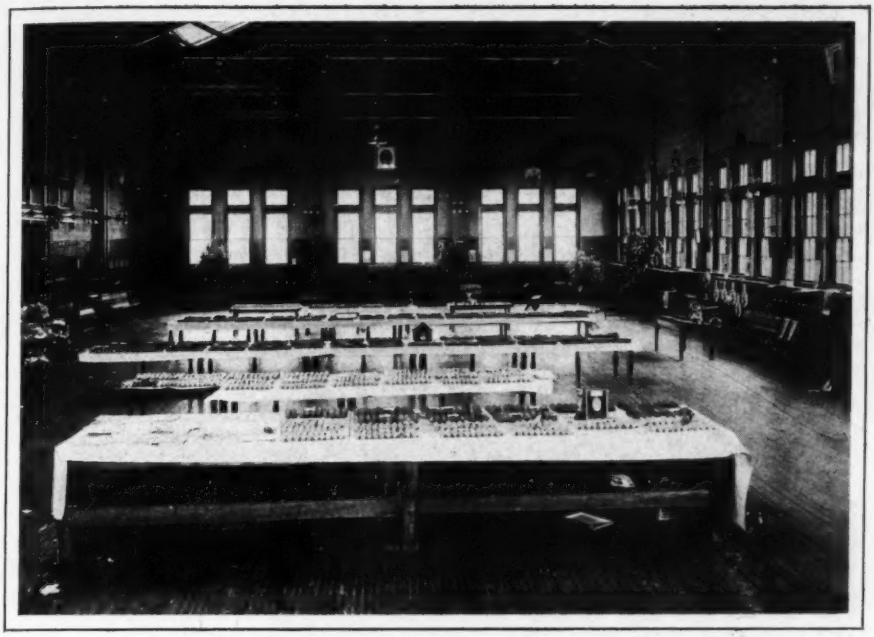
"It will be seen that the real cost of the fertilizer on this farm is $634, not $272. In this case, a so-called profit of over 100 per cent by the usual method of figuring would really be a loss, because the fertilizer is less than half the total cost," Dickey states.

The labor costs are charged at the average cost on this farm for the year

(*Turn to Page 57*)

Real Cost of the Increased Crop Due to Fertilizing 60 Acres of Timothy

Cost of Fertilizer		
8,000 pounds nitrate of soda	$185.00	
2,080 pounds muriate of potash	39.77	
10,354 pounds of superphosphate	47.37	$272.14
Other Costs		
Freight on fertilizer	26.66	
39½ man hours hauling fertilizer at 21.6c	8.53	
58 horse hours hauling fertilizer at 13.2c	7.66	
29 man hours mixing fertilizer	6.26	
84½ man hours sowing fertilizer	18.25	
101½ horse hours sowing fertilizer	13.40	
200 man hours hauling in and storing 60 tons hay	43.20	
160 horse hours hauling in 60 tons hay	21.12	
108 man hours pitching hay to baler	23.33	
Meals for hay pressers	14.40	
Meals for hay pressers' horses	7.30	
118 man hours hauling 60 tons to railroad	25.49	
208 horse hours hauling 60 tons to railroad	27.46	
Use of barn (proportionate share)	95.00	
Fire insurance (proportionate share)	3.00	
Interest on above costs for 7 mos. 6%	21.46	$362.52
		$634.66



Plenty of light and space at the corn show aid judges in studying the corn.

The Annual Corn Show

By G. L. Schuster

Secretary, Delaware Corn Growers' Association

THE winter corn show has become one of the traditional institutions in many communities. Corn shows have played an unique and important role in the development of corn throughout the country. The Annual State Corn Show is the climax of all such community activity, friendly rivalry, etc.

Have corn shows outlived their usefulness? The corn show directs attention toward the requirements of good corn. There is an exchange of ideas on corn culture, adaptability of varieties, disease resistance, yield, fertilizers, etc., all of which are valuable for the production of better corn and more corn. Many corn growers are producing from 50 to 75 bushels per acre more than the average corn production for their state. A dissemination of the knowledge as to "how they do it" is valuable, and in this the corn show is valuable.

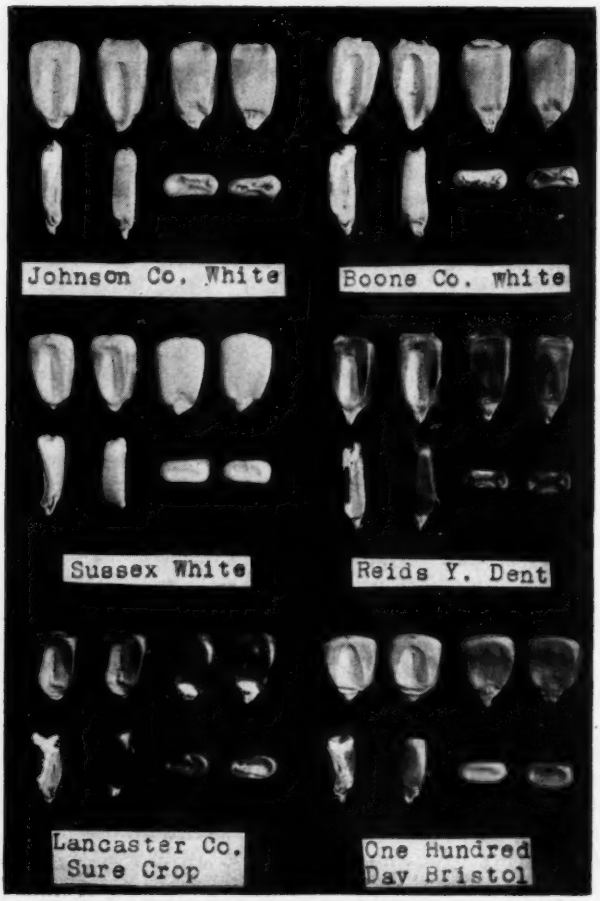
The life of the state show depends upon the local shows. These may be held by a community organization, grange, school, chamber of commerce, or what not. A few general rules should be adhered to in planning a show. All corn exhibits should be classified as white, yellow, or mixed classes unless they are classes for varieties. An exhibitor should enter one

exhibit only to a class. Exhibits should consist of 10 ears, except for single ear classes. Every exhibit should be produced on the exhibitor's farm during the season just past.

The premium list should receive careful consideration. The premiums may be cash, merchandise, ribbons of merit, or a combination of any of the above. It is better to have a large number of premiums of moderate value rather than a few expensive ones. A corn show should not only award the best producers, but should also reach out and encourage the less able ones. A first, second, third, fourth, and fifth premium in every class of entries will reach more people and attract more entries than just three awards to a class.

Have the show in a hall that is readily accessible. The hall should be well lighted and roomy. Light is very essential for the study of corn characteristics by the judge as well as the growers. Roominess makes it more inviting to the visitors.

Experience is a great factor in the selection of corn. One learns corn and its important characters by working with it. I once knew a young farmer lad that moved 500 bushels of corn in picking out a 10-ear sample. It is needless to say that he won. The International Grain and Hay Show has set up a desirable type for white and yellow corn with variations as to size and indentation that will be permitted. This should be followed in communities where corn of this kind is grown. In selecting a 10-ear sample, select one typical ear that is sound and free from disease and then select nine others like it.



Kernel characteristics of corn varieties should be used in selecting and judging exhibits.

Some varieties will not conform to the International Grain and Hay standards. In this case the vertical standards should be followed. Much experimental evidence has been gathered in recent years that leads to the general conclusion that reasonable variations of visible characters within

(*Turn to Page* 60)

Machines like this save many expensive harvest hands.

Machines Aid Harvest

By U. V. Wilcox

Washington, D. C.

TWO nationally known authorities have computed the saving that the farmers have passed on to the consumer by their saving in the greater use of machines in the harvesting of their crops.

C. D. Kinsman, formerly of the U. S. Department of Agriculture and a member of the American Society of Agricultural Engineers has estimated after an extensive survey that the American farmer has saved the cost of hiring some 130,000 men, making an economy of $30,000,000 in the harvesting of the crop for 1927.

Professor Walter G. Ward of the Extension Department of the Kansas State Agricultural College estimates that Kansas farmers alone used 30,000 less harvest hands than previously, due to the greater use of machine methods.

These estimates, admitted as accurate, are in line with the recommendations made a year ago by Secretary of Agriculture Jardine that the farmer give more study to the use and application of machinery to his cost of harvesting the crops that he grows.

Mr. Kinsman finds that the farmer has not worried so much regarding labor shortage and the competition of city jobs and easier living for the floating help. Using the figures gathered from all classes of equipment manufacturers, it is evident that the labor-saving harvest machine is filling the gap.

Combine machines have been particularly popular in the harvesting of crops this year, according to Mr. Kinsman and Prof. Ward. There are 43,000 to 45,000 more combines in the

western sections of the United States and Canada. Each machine it is believed has eliminated at least three high-priced itinerant farm workers, making a total of 130,000 men. However, in many instances more than the labor of three men has been saved.

"These men," says Mr. Kinsman, "not only drew high wages, but requested and insisted upon having quantities of high-priced food, much of which had to be specially purchased. There was also the cost of extra bedding, loss by breakage, fires, and thievery.

"Due to the greater use of modern machinery the harvest period is being shortened to two weeks instead of two months. Thus allow $5 a day for each of the 130,000 men dispensed with for eight weeks and there is a total saving of close to $30,000,000."

Harvest Help Expensive

The picturesque harvest-tide of other years is doomed to become one of the lost institutions of rural America. From the highways and byways, mountains and seas, men came to work in the harvest fields—white-collar men seeking a breath of outdoors, adventurers desiring to add to their experiences, farmers of other crops who took advantage of the high prices paid for labor, collegians on a lark or hoping to get money for their education, tramps willing to work for a week.

Once hired, they lived on the fat of the land. Chicken and cream gravy, noodles, corn, eggs, milk, home-cured ham and bacon, home-churned butter, and all the other delicacies of the farm were theirs in abundance. However frugal the farmer might be, he never stinted when it came to feeding the appetites of his harvest crew.

Many harvest hands followed the wheat reaping through from Texas, Oklahoma, Kansas, Nebraska, the Dakotas, and up into Canada, enjoying lucrative employment throughout the summer. But these harvesters are by way of becoming a memory, like the cowpunchers.

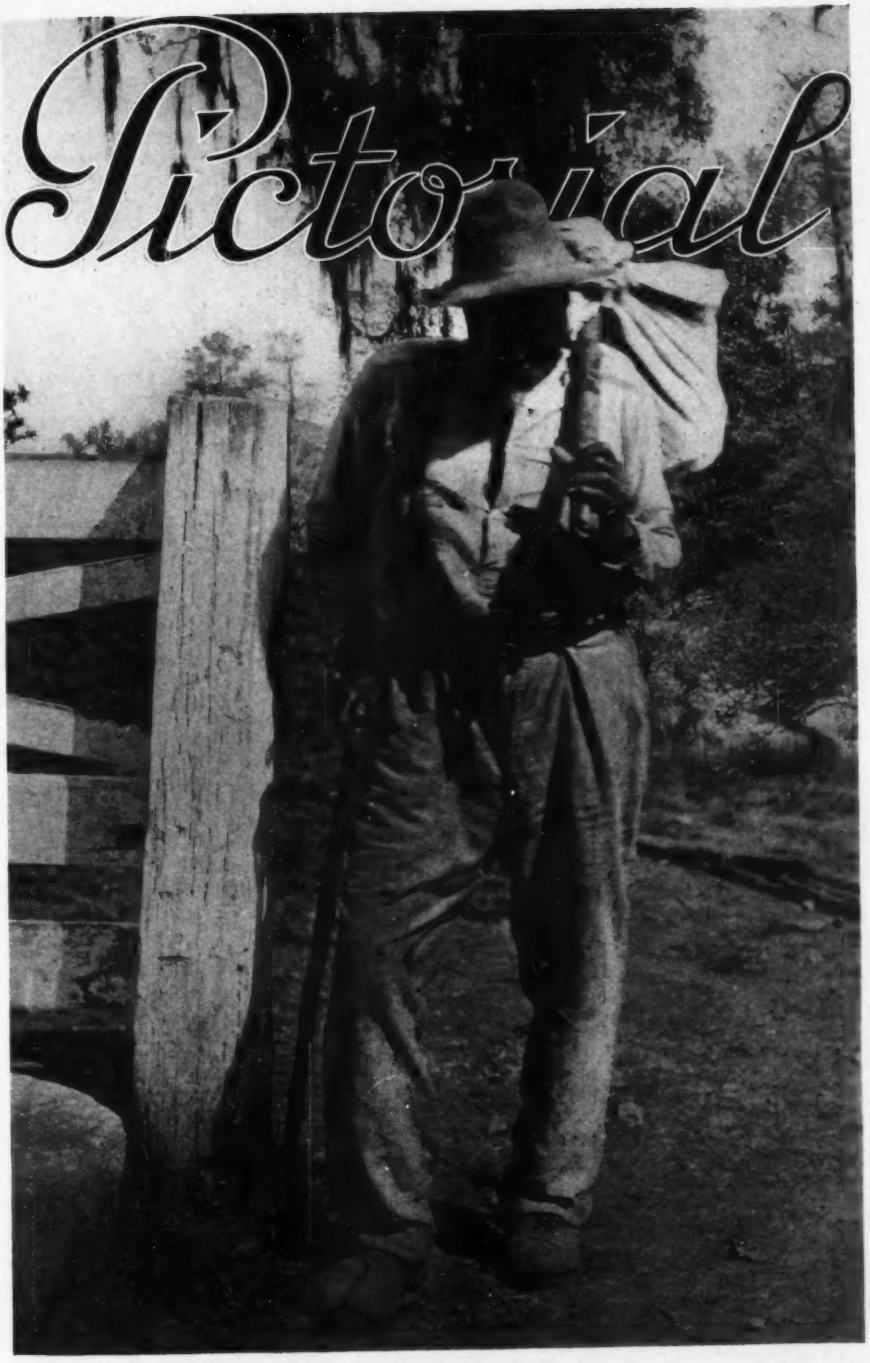
The change that is so rapidly maturing and which the figures this year make so graphic is nothing basically new. The greater use of machinery is the result of better machinery and the American farmer's instinctive mechanical ability to use this machinery effectively. Then too, each year finds young men, fresh from an intensive study of agriculture, taking up their places upon the farms and ranches, and they are anxious to use the best methods possible.

The Pacific slope has been the pioneer in the use of machines for harvesting, this and other surveys make evident. The late Benjamin Holt and Daniel Best built combine harvesting machines to meet the conditions prevailing upon the great wheat farms, like the Miller and the Lux and Lucky Baldwin ranches. These men developed the caterpillar tractor for use in territory where hills or swamps and various obstructions made traction difficult. The caterpillar was given world-wide recognition at the time of the world war and its incorporation as a part of the army tanks.

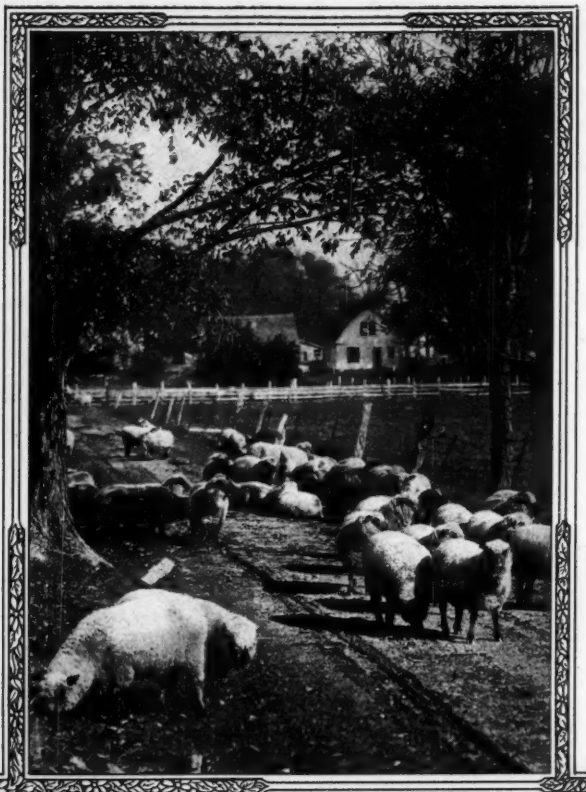
It has only been during the last year, however, that the figures show that the American farmer generally has turned to the use of the new harvesting equipment. The native American agriculturist is an ingenious individual and after accepting the idea of greater use of machines for harvesting he has turned to adapt it for a wide variety of uses. He has been responsible for the "pick-up" system that has this year been used so widely. This permits the handling of such crops as clover, alfalfa, timothy, milo maze, and kaffir maize.

The future will see still greater labor cost reductions, which for the country as a whole, run about $1,250,000,000 a year in wages and an additional $1,000,000,000 for board, lodging, and other expenses.

Pictorial



Old Peter Vinegar comin' home.

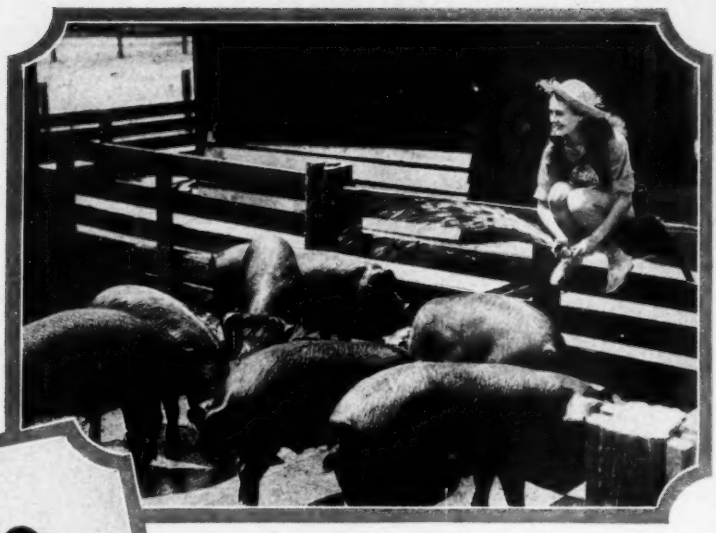


Left: On Fall evenings the flock comes home by itself. There is a feeling of hominess and a sense of security about feed-filled farm buildings when the frost comes that even the animals seem to enjoy.

Below: Two pals just enjoying Indian Summer together.

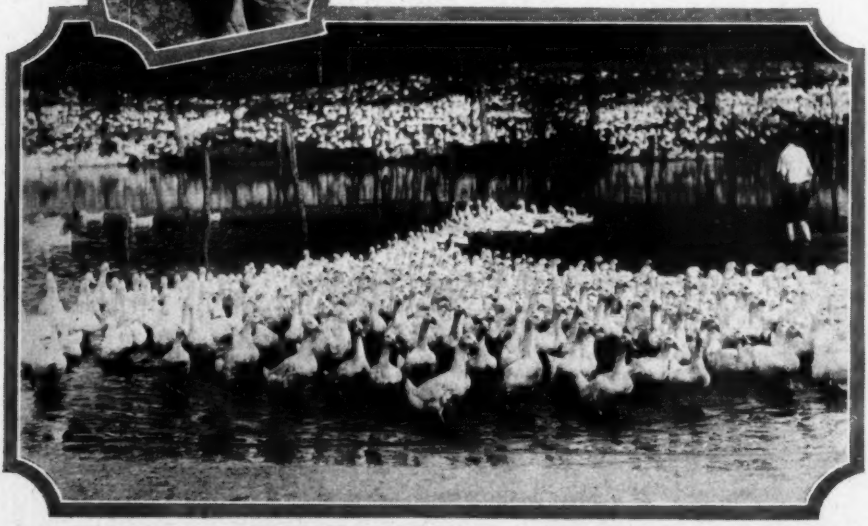
Right: Drink, dern ye, drink! What farm boy's patience has not been tried to the limit in teaching a "dumb" calf to drink out of a pail? A good spattering of milk has increased many a boy's vocabulary.

Below: A picturesque mountain roadway between Austria and Italy.



Above: Marceline Day, movie actress, recently visited a large hog ranch at Fontana, California. Dressed like a young farm lad, she had a good time giving these pigs a cold shower.

Left: This picture and its companion on the next page were taken "Down where the cotton and the sweet potatoes grow."



Long Island duckling in the making! These are just a few of the thousands of ducks being fattened on Long Island, New York, farms for the holiday trade.

Above: Carefully gathering grapefruit in Florida. The popularity of this fruit is relatively recent. The first shipment from Florida to New York and Philadelphia was made some time between 1880-1885 and netted the shippers about 50 cents a barrel.

Right: The chief worry of this colored man is not the price of cotton, but the picking of it.

Why farm boys stay on the farm! Every one of these girls sings and dances, is a farm girl, and a member of the Gold Medal 4-H Club at Worthing, South Dakota.

Right: Looking for red ears! The Misses Lucille and Nava Beaver of Statesville, North Carolina, believe they will find some in this pile of snapped corn.

Left: Another sign of Fall. Along with the winter's supply of vegetables and canned fruit there must be plenty of savory ham.

Right: Farm relief! Who'd ask for any more? This is I. A. Riise of Turlock, California, with his nine sons. Besides these fine boys, Mr. Riise has three daughters who couldn't be crowded into the picture.

The Editors Talk

New Purchasing Index Numbers

The U. S. Department of Agriculture is to be commended for a change made in the method of measuring purchasing power of agricultural products. From now on, this index number will be based upon the retail prices which farmers pay for what they buy instead of the wholesale prices of those products.

The measurement of farm commodity purchasing power on the basis of retail instead of wholesale comparison will tell a slightly different story from that told by the index numbers previously in use. That the new index numbers will prove more accurate as a measure of the exchange value of farm commodities is recognized by the fact that farmers obtain most of their supplies at retail rather than at wholesale.

The change was illustrated for the first time in the price index number comparisons for June of this year. For that month, according to the new method of reckoning, the purchasing power of farm products was 93 per cent of the level prevailing in the five-year period, August, 1909, to July, 1914.

The Department points out, however, that the new index numbers do not measure the purchasing power of farmers but merely that of a fixed quantity of farm products. They show the power of a given amount of agricultural commodities to purchase certain kinds of other goods as compared with pre-war exchange ratios.

The improvement is not a complete measure of the agricultural price situation. Although the prices of commodities purchased by farmers are now nearly on the level with the prices of products sold by farmers, taxes and farm wages remain relatively high. In June, 1928, farm taxes were 250 per cent of the pre-war level, and farm wages 170 per cent of that level. The prices of commodities purchased by farmers for use in production were lower than the prices of commodities entering into family living. The index of the prices of commodities used in production averaged about 148 per cent of the pre-war level, whereas prices of commodities used for family living averaged 162 per cent of the pre-war level.

Contributing to the high cost of living on the farm in June, were furniture and furnishings at 208 per cent of the pre-war; clothing at 179 per cent of the pre-war; and building materials for the home at 171 per cent of the pre-war level. Food prices were on about the same level as commodity prices generally. Some production items were relatively low, notably feed and fertilizer prices. The price of farm machinery was close to the general price level.

This constant study of the purchasing power of farm products serves to give a clearer picture of the agricultural situation and to be of assistance in attempts to adjust the difficulties which farmers have experienced since the World War.

Commerce and Science

Agricultural Experiment Stations and Colleges, as well as other authorities, often make reports on the progress of scientific research work. For instance, regarding the effect, on crops, of many of the lesser known chemical elements found in the soil, sometimes called the minor nutrients, as distinct from nitrogen, phosphoric acid, and potash, reports are made. Of course, progress reports also often are made on phases of research in connection with these better known plant nutrients.

There is, however, one rather important problem in connection with the publication of such reports. They represent progress only and not final results. The result may eventually turn out as indicated in the early stages of the research work. Then again, the final results may not confirm the initial work. Yet if the scientific world and the world of commerce and the farmer are to know what is going on these reports are essential.

There is a grave danger that these valuable progress reports will become less and less in number and content if science does not feel assured that such progress data will not be represented as final in commercial advertising uses.

On the part of commerce there is a natural and legitimate desire to take the results of scientific research and give them a popular and wide publicity.

On the part of many scientific workers there is apparently a fear that business will give to progress data a finality and assurance that were not intended or warranted by the initial publication of such data.

If unfortunately any such cases of premature, wide, and final publicity have been given to progress data, it is probably due to a misunderstanding of the status of the data rather than to any other cause.

Agricultural business knows full well that it would only hurt its own business and prestige to present to the farmer as final, and as a basis for his expenditures, information and data that afterwards may be proved to be wrong.

The farmer does not forget—Business knows this.

Yet because the possibility of too wide publicity exists, through not fully understanding the status of published results, it is a question that organized agricultural business might well take up and discuss with research workers with the object of creating that confidence between the two groups that is so essential if full progress reports are to be made available. Certainly their curtailment would be a serious detriment to the practical solution of many urgent problems.

Dry Land Farming

Fifty years are a short time in which to develop a new agricultural country, yet it can be said that this span of years in general will cover the development of dry land farming in the West.

It has taken 25 years for farmers of Idaho, Washington, and Oregon to learn how to produce wheat with their present success. An eastern farmer who decided "to go West" has had to unlearn practically all he knew about farming. Recognition of the untiring industry and progressiveness of these men is accorded by increasing realization of the importance of dry land farming to American agriculture.

Receiving only one-sixth to one-half of the amount of rain and snow

which falls in other parts of the United States, farmers in the arid region rightly deserve credit for their ability to wrest from these fertile soils profitable crops without the rainfall usually considered necessary for successful production.

In this issue of BETTER CROPS WITH PLANT FOOD, we are publishing a story on the dry land farming in the Columbia basin. This region is known as the second great soil district of dry farming territory in the United States, the first being the Great Plain district which includes parts of North and South Dakota, Nebraska, Kansas, and Oklahoma, and parts of Montana, Wyoming, Colorado, New Mexico, Texas, and Minnesota. The third region of importance is the Great Basin, which includes nearly all of Nevada, half of Utah, and small portions of Idaho, Oregon, and Southern California.

The Columbia River basin includes the State of Washington, most of Oregon, the northern and central parts of Idaho, western Montana, and extends into British Columbia. The soils are generally of volcanic origin. The chief dry farming crop of this region is wheat. Western Washington, known as the "Palouse country," is famous for its wheat. Satisfactory production has been obtained in sections where the rainfall has been only 10 inches.

Quite naturally, the first concern of these farmers has been the conservation of moisture which has been accomplished by summer fallowing. Little, if any, attention has been given to maintaining soil fertility, with the result that under repeated cropping many of these lands are beginning to hint at a depletion of plant food. In regions of a little greater rainfall, where summer fallowing is not so necessary for conservation of moisture, and the system has resulted in a loss of organic matter in the soil, progressive farmers are already looking to the use of commercial nitrates to bring up soil fertility. That it will only be a question of time before other plant nutrients will be necessary to get profitable yields is recognized.

Cotton Market Reports

Cotton reporting has always been a debatable subject to people in the cotton belt. Government reports have been severely criticised. Therefore, the Department of Agriculture should receive the appreciation and cooperation of every one for its recent step in making its cotton market service bulletins more comprehensive and authoritative.

The Cotton Quotation Service bulletins which have been issued weekly at certain field offices of the Division of Cotton Marketing of the Bureau of Agricultural Economics have been discontinued. In their place a new service has been inaugurated with first releases on September 1. The new project differs from the former one principally in that it views cotton markets of the world as interrelated and undertakes to review market conditions more comprehensively. The old project concerned itself rather with reporting local conditions in markets and sections of the cotton belt and adjacent to the points where the bulletins were issued.

Under the new plan telegraphic reports as of each Friday are received Saturday morning from the Division's own representatives at Charlotte, N. C., Atlanta, Ga., Memphis, Tenn., New Orleans, La., and Houston, Texas, and from special correspondents at Boston and New Bedford, Mass., and Green-

wood, Miss. These telegrams contain up-to-the-hour information on the state of the demand for various grades and staples of cotton, qualities in supply and qualities sought, basic prices, grade conditions and staple premiums, fixations, and other factors of importance. Similar prompt information is received at the same time from the principal European markets by cable. The data thus assembled in Washington are carefully reviewed, when the more vital features are consolidated in a weekly review which is telegraphed to the field officers on Saturday morning. At the field offices it is mimeographed and mailed so that it may reach almost every corner of the cotton belt early Monday morning.

To the grower who is ready to dispose of a crop, this is a valuable service. Knowing the size of the world crop and the world carryover, the general commodity or business situation, and the actual growth of the demand for cotton, due to the increased population and to increasing the use of cotton, he can tell with some degree of confidence what the market will do and govern his operations accordingly.

Yet There Is Hope

Writers of books can be divided into two broad classes, writers of gloom and writers of hope. The prophets of gloom probably make more money from their books than the prophets of hope. The gloom takes all sorts of forms—political, biological, cultural, and particularly economic. It is refreshing to occasionally find something to stack up against the prevalent flood of gloomy thought.

One such instance was a very significant event in Wales. South Wales is suffering perilously from unemployment. The coal industry, on which it depends, is in a deplorable state. Some men have not had work for years. Yet, in spite of these grim conditions, large numbers of the humble folk of South Wales spent a week in singing. Reports show that South Wales can now claim its pre-war position as a center of brilliant choral singing. Most of the contestants were amateurs.

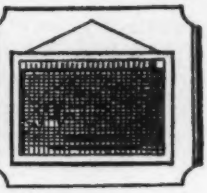
The area of Wales is small, yet in one choral contest alone it was able to recruit ten choirs of over a hundred male voices in each choir to sing Shubert's "Song of the Spirits." A group of over a thousand men in a festival of song amidst the worst economic conditions is surely a tribute to courage and the finer things of life, showing that the real character of a people is rooted deep in its soil and its history, quite independent of economic conditions, bad as they may be.

The report continues to state that there was an enormous house to hear the ten choirs and very often the prolonged expressions of enthusiasm were as much a source of embarrassment as a pleasure to the competitors.

About the same time an initial group of ten thousand unemployed miners was shipped overseas to help in the harvests as the only possible way of giving them work.

This is just a significant note for the world's writers of gloom who are so anxious to tell us of the terrible things that are going to happen to our present civilization, unless we sign on their particular dotted line.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

RAISING CHICKS OFF THE GROUND

A farmer of Richland county, Illinois, has had noticeable success in raising chicks on a wire floor entirely off the ground. This farmer raised 1,040 chicks and lost only 194 during the season, a mortality rate 10 per cent below that of other flocks in the same class, according to the extension poultryman of the University. This farmer, W. D. Householder, who is one of several hundred flock owners cooperating with the University in a poultry sanitation project, devised the pens himself. Each of Mr. Householder's brooder houses is equipped with a "porch" 10 by 12 feet floored with heavy wire screen.

COUNTY CLEAN ON FIRST TEST

Carlton county, Minnesota, has an enviable record in tuberculosis eradication. One test was sufficient to put this county on the accredited list. When the 16 veterinarians after two weeks' work finished the testing job, it was found that only ½ of 1 per cent of the animals had reacted. Nine townships had no reactors, several had only 1 or 2 each, and only 58 farms in the whole county had reactors, only a single farm being heavily infected.

PHALARIS ON PEAT

Farmers having peat land in Minnesota are being introduced by the experiment station to phalaris, a coarse, tall grass grown in England in 1824 and in Germany in 1850. Agronomists of the station predict it will become a valuable forage crop on such lands, and it is already being used by a few farmers in Blue Earth, Waseca, and Le Sueur counties. One farmer who has a five-year-old stand says he gets two or three crops a season and cuts about 10 loads to the acre. Although the hay is coarse, it has the great advantage in being very palatable.

LEARNING FROM BRITISH DAIRYMEN

The English dairyman's efficient handling of pasture lands is the most valuable observation made by the representatives of the American dairy industry who attended the International Dairy Congress at London recently, says A. M. Loomis, secretary of the National Dairy Union who acted as secretary of the American delegation at the Congress. Loomis says the good English farmer will carry a mature dairy cow for six months of the year on from one-half to one acre and maintain a heavy milk flow all the time. "The keys to the English system," he says, "are alternate grazing of small fields and fertilization which, with a fairly even distribution of rainfall and relatively low evaporation, combine to make conditions so favorable to pasture grasses that a given amount of land will carry from 2 to 5 times as many animals as under the ordinary method of pasturing followed in this country. . . . Under this plan the pastures are diveded into 6 or 8 fields and the animals are allowed to

pasture for only a few days in each field and then moved to another, thus providing new tender grass at all times. Fertilization consists in several applications of commercial fertilizer—artificial manure, as it is called in England—made at intervals from late winter to fall."

GRASS AT ROTHAMSTED

Mr. Loomis also made a study of pasture management at the famous Rothamsted experiment station in England. "The grass plots at the Rothamsted Experiment Station," he said, "were extremely interesting. Here for 72 years they have fertilized grass land in various ways without any seeding or cultivation. The surprising thing was the large amount of clover on the unlimed soil wherever phosphate and potash fertilizer had been applied. I had heard that cattle graze by preference on phosphated grass land but I had never seen proof of it until my visit to Rothamsted where the claim was well substantiated."

ANEMIC PIGS

In spite of his liver, which helps humans similarly afflicted, the pig suffers from anemia. This disease of pigs, says L. P. Doyle of Purdue, is relatively new and is serious. Modernism has been the pigs' undoing in this case —centralized hog houses where large numbers are raised under one roof. Get out and get under the moon—and under the sun, too—is the recommendation to the anemic pig. Cod liver oil, yeast, orange juice and iron do not prevent the disease or cure it.

GIANT SUGAR CANE FOUND

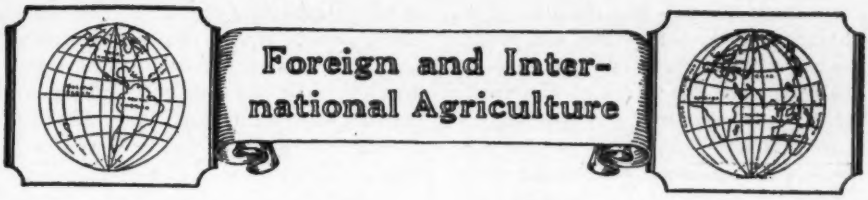
The plant exploration party, headed by Dr. E. W. Brandes of the U. S. Department of Agriculture, which left for New Guinea several months ago, is now returning after having collected 167 varieties of sugar cane gathered in the native home of the plant. There is in the collection one new species, a hard, straight cane, growing to a height of nearly 33 feet. The new kinds of cane will be used in tests and for interbreeding in efforts to create varieties resistant to mosaic and other diseases. During the trip the party traveled 10,000 miles by airplane, 700 miles by canoe, and 400 miles on foot.

FEED HAY LANDS FERTILIZER IN FALL

Fall fertilizing of hay lands pays, says C. J. Chapman of the Wisconsin College of Agriculture, who points out that an application some time between harvest and frost has two important advantages—it stimulates fall growth and also becomes thoroughly incorporated with the surface soil before growth starts in the spring. He recommends 45-per-cent superphosphate as being cheaper in the end than that containing less and suggests using from 100 to 125 pounds to the acre—300 pounds if 20-per-cent superphosphate is used. For sandy loams and lighter soils, he says, phosphate should be supplemented with potash. For sandy loams 0-16-8 or 0-12-6 mixtures are recommended in amounts up to 350 pounds to the acre. The same amounts of 0-12-12 or 0-14-14 are recommended for light sandy soils.

$1 AN HOUR FOR TRACTOR

Records kept by a group of Iowa county, Iowa, farmers in cooperation with Iowa State College are indicative that the cost for the State as a whole is about a dollar an hour. The figure for 1927 was $1.02 which was practically the same as for 1926. Average cost of fuel was about 30 cents an hour, depreciation 29 cents for hour of use, interest on the investment averaged 11 cents, repairs 12 cents, labor in repairing and overhauling 7 cents, oil and grease 10 cents, and miscellaneous expenses amounted to 3 cents for hour of use.



Effects *of* Potash *on* Grass

Editor's Note: *As land values and taxation increase, the profitable use of commercial fertilizers on pastures, meadows, and hay fields becomes an increasingly important question. Many practical men are enquiring what fertilizers to use and when and how to use them.*

The top-dressing of such lands with fertilizers is, therefore, of timely interest to a great number of American farmers. They want to know how they can grow at home more feed in order to save the money they are now paying out for bought feeds.

To make a profit, however, the conditions affecting the use of fertilizers on pastures, meadows, and hay lands must be carefully studied on each individual farm. We need all the data and information that can be obtained. Many experiment stations are doing work along this line.

With a desire to aid as much as possible, BETTER CROPS WITH PLANT FOOD *hopes to publish short articles from time to time on the work being done by agricultural experiment stations and the results obtained by farmers. It is also interesting to know what is being done in other countries where under present conditions the most has to be made out of every acre in order to make the land pay. Following this policy we are quoting a report, made in June, of the potash effects on grass lands in Great Britain.*

CERTAIN grass land trials which were laid down even as recently as the middle of March are already showing marked potash effects. In Berkshire demonstration plots were laid down on a gravel soil at Wargrave and at Theale. At Wargrave, both basic slag and superphosphate alone were used to compare basic slag plus kainit and superphosphate plus kainit, and in June, although the fertilizers were only applied in January, there was a very striking improvement obvious, both from the superphosphate and kainit and the basic slag and kainit dressings. It was interesting to note that the phosphates alone were showing practically no effect at all while the two plots where kainit was applied in addition stood out prominently by reason of the vigorous growth of clover and other leguminous plants which gradually spread over the plots.

In the Theale experiments, also on a gravel soil, a very marked improvement of poor pasture was effected by a dressing of potassic mineral phosphate containing 40 per cent phosphate and 10 per cent potash, the phosphates being so fine as to pass through a sieve with 120 meshes to a lineal inch. In point of fact, although the fertilizers in this case were only applied in January, the improvement from basic mineral phosphate was quite as marked to the eye as the improvement effected by a mixture of superphosphate, steamed bone flour, and kainit applied at the same time on an adjoining plot. The rapidity of

the action of potassic mineral phosphate where the phosphates and potash were ground so finely together and the uniformity of the effect of the treatment were certainly a revelation.

In Hertfordshire, another experiment was laid down on the gravel at Kings Langley, and the fertilizers in this case were applied in the middle of March. In this case a comparison was to be made between superphosphate and ground mineral phosphate, and also the same fertilizers along with potash. One of the features of this experiment was the striking effect of potash, there being no difficulty whatever in picking out the potash-treated plots. The superphosphate and potash plot was superior to the ground mineral phosphate and potash plot although there was distinct evidence of improvement in the latter plot. Where ground mineral phosphate and potash separately applied on the same plot had been compared with potassic mineral phosphate, which is a mixture already made up of the same ingredients, the latter showed up more quickly than the former. The uniformity of the improvement effected by the ready-made mixture was certainly a feature of this plot.

Other striking effects from potash on grass land were obtained on the silt loams on the lower wealden strata at Goudhurst. The improvement effected by basic slag and potash was so marked that one farmer did over 100 acres with basic slag and kainit. The improvement of poor pasture by this treatment on this large scale was very striking and it is not too much to say that the land in consequence has at least been doubled in value from the grazing point of view. Slag alone on the fine silty loams was of very little good but when supplemented with potash it produced very effective results indeed.

A Grad Makes Good

(*From Page* 24)

price for his crop during this year. All of the number ones sold at $1.65 per bushel. This would have been slightly higher if he had not held about one-third of his crop.

In 1927 he raised about three acres of Irish Cobblers and about 13 acres of Green Mountains on his own farm, and on shares with a neighbor, 4½ acres of Green Mountains. This year he raised less hay and no corn for grain at all. This additional free acreage was turned into sweet corn for seed purposes. Thirteen acres were devoted to seed and seven acres of sweet corn were to be sold green, that is fresh, on a nearby market.

This year a change in the fertilizer was made, the concentrated form known as 10-16-14 fertilizer was used, approximately 1,200 pounds per acre being applied. The 10-16-14 fertilizer is a double 5-8-7 and it shows an increase of almost 600 pounds per acre in the amount of regular fertilizer applied. Another decided change in the crop system this year was the use of Vermont certified seed only. A new spray rig was purchased this year, one of the power type spraying four rows of potatoes with three nozzles per row; instead of spraying only eight times he averaged eleven times for this year. The Irish Cobblers gave a yield of 150 bushels per acre and the Green Mountains varied from 175 to 450 bushels per acre, due partly to a tremendous infestation of aphis. The total average for the Green Mountains

(*Turn to Page* 56)

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"Studies Preliminary to the Establishment of a Series of Fertilizer Trials in a Bearing Citrus Grove," Agr. Exp. Sta., Berkeley, Cal., Bul. 451, Apr., 1928, L. D. Batchelor, E. R. Parker, and Robert McBride.

Annual Report of the State Chemist of Florida, for the Year Ending Dec. 31, 1927, Vol. 37, No. 1, Dept. of Agr., Tallahassee, Fla., R. E. Rose.

"Lime for Michigan Soils," Ext. Div., Mich. State College, East Lansing, Mich., Ext. Bul. 57, Jan., 1928, John Sims.

"Analyses of Commercial Feeding Stuffs and Registrations for 1928," Agr. Exp. Sta., New Brunswick, N. J., Bul. 471, June, 1928, Charles S. Cathcart.

"Toxicity to Cotton Seedlings of High Concentrations of Soluble Nitrogenous Fertilizers," Agr. Exp. Sta., Raleigh, N. C., Tech. Bul. 30, May, 1928, L. G. Willis and E. A. Davis.

"Analyses of Commercial Fertilizers," Agr. Exp. Sta., Clemson College, S. C., Bul. 250, Aug., 1928, R. N. Brackett and D. H. Henry.

Soils

The fertilizer requirements and some cropping systems for two important soils in Pennsylvania are clearly and fully explained by Professors J. W. White and F. D. Gardner in their recent bulletin "Soil Fertility Experiments on Volusia and Westmoreland Soils," Pennsylvania Experiment Station, Bulletin 229. The Volusia soils occur mainly in Northern Pennsylvania and Southern New York, while the Westmoreland soils occur mainly in Southwestern Pennsylvania.

The two soils differ somewhat in their needs. The Volusia soils are very acid, and generous applications of lime are needed before anything else. On these soils the order of importance of the fertilizer elements is potash, phosphoric acid, and nitrogen, the authors concluding that a mixed fertilizer, relatively high in potash, should be used. Nitrogen was of little value on these soils except in the case of Kentucky bluegrass pasture. When corn is grown for grain, a generous application of fertilizer is necessary to secure a satisfactory yield and maturity. Of the rotations used, that of oats, hay, ensilage corn, and buckwheat proved to be most profitable for the dairy industry, important on this soil.

The Westmoreland soils require moderate amounts of lime and the order of the fertilizer elements required for these soils is phosphoric acid, potash, and nitrogen. Potash was beneficial for the hay crop and Kentucky bluegrass pasture, while nitrogen benefited the grain crop and the pasture.

On both soils reinforced manure was satisfactory, being about equal to complete fertilizers, while six tons of manure were more profitable than larger amounts. The quality of the pasture was considerably improved by the use of lime, and complete fertilizers or reinforced manure.

Those interested in fertilizers and cropping systems, in sections where these soils occur, will find this bulletin contains much valuable information.

Crops

An attractive 8-page bulletin on "Producing Sugar Beets" was re-

ceived this month from Michigan State College. It is written by C. R. Oviatt, and is listed as Michigan Extension Bulletin 67. Because of the importance of sugar beets to the farmer who practices diversification, this handy treatise of the problems to be met in a successful growing of the crop should receive wide interest. In few words, soil types, drainage, general recommendations for fertilization, planting, and harvesting are covered.

In the "Fortieth Annual Report of the Director of the Agricultural Experiment Station," Kingston, R. I., some very interesting results of experiments on the efficiency of fertilizers and manures are given. For instance, potatoes from four differently fertilized experimental plats were boiled, mashed, and baked, and judged on their mealiness or lack of it. The results showed that the potatoes provied with a liberal potash supply were found preferable. The potatoes from the plat which had been given no potash for 17 years were placed last.

Other crop bulletins received this month include:

"Thirty-seventh Annual Report," Agr. Exp. Sta., Auburn, Ala., M. J. Funchess.

"Lessons from Southwestern Indian Agriculture," Agr. Exp. Sta., Tucson, Ariz., Bul. 125, May 15, 1928, S. P. Clark.

"Experiments with Small Grains in Southern Arizona," Agr. Exp. Sta., Tucson, Ariz., Bul. 126, June 1, 1928, Ian A. Briggs and R. S. Hawkins.

"Timely Hints for Farmers," Agr. Exp. Sta., Tucson, Ariz., No. 159, May 1, 1928, S. P. Clark.

"Colorado Wheat Varieties," Agr. Exp. Sta., Fort Collins, Colo., Bul. 329, Jan., 1928, Alvin Kezer, D. W. Robertson, F. A. Coffman, Dwight Koonce, and G. W. Deming.

"Effect of Acid Wash on the Keeping Qualities of Apples," Agr. Exp. Sta., Fort Collins, Colo., Bul. 343, Aug., 1928, Ferris M. Green.

"Report of the Director for Year Ending June 30, 1927," Agr. Exp. Sta., Storrs, Conn., Bul. 149, March, 1928.

"Vegetable Garden Planting Table," Col. of Agr., Athens, Ga., Vol. XVII, Bul. 352, Aug., 1928, R. L. Keener.

"Report of Moses Fell Annex Farm," (Bedford, Ind.) Agr. Exp. Sta., Lafayette, Ind., Cir. 152, June, 1928, H. J. Reed, H. G. Hall.

"Report of the Director," (Agricultural Extension Work in Indiana), Dept. of Agr. Ext., Lafayette, Ind., G. I. Christie and T. A. Coleman.

"Report of the Director," Agr. Exp. Sta., Lafayette, Ind., G. I. Christie and H. T. Reed.

"Soybean Inoculation Studies," Agr. Exp. Sta., Ames, Iowa, Res. Bul. 114, June, 1928, Lewis W. Erdman and F. Scott Wilkins.

"Top-Working Apple Trees," Ext. Serv., Agr. Exp. Sta., Orono, Me., Bul. 177, Feb., 1928, A. K. Gardner.

"Growing the Black Raspberry in Michigan," Ext. Div., Mich. State College. East Lansing, Mich., Ext. Bul. 62, March, 1928, A. H. Teske and V. R. Gardner.

"Cherry Production in Michigan," Ext. Div., Mich. State College, East Lansing, Mich., Ext. Bul. 64, March, 1928, A. J. Rogers.

"Investigations on Winter Wheats in Michigan," Agr. Exp. Sta., East Lansing, Mich., Tech. Bul. 88, Apr., 1928, E. E. Down, H. M. Brown, A. J. Patten, O. B. Winter, and G. H. Coons.

"Ultimate Effect of Hardening Tomato Plants," Agr. Exp. Sta., East Lansing, Mich., Tech. Bul. 89, Apr., 1928, John W. Crist.

The Quarterly Bulletin, Agr. Exp. Sta., East Lansing, Mich., Vol. XI, No. 1, Aug., 1928.

"Report of Northwest Experiment Station, Crookston 1927," Dept. of Agr., University Farm, St. Paul, Minn., A. A. Dowell.

"Report of Three-Acre Better Corn and Cotton Production Contest," Ext. Dept., Miss. A. & M. College, Miss., Bul. 47, Feb., 1928, R. S. Wilson.

"Inferiority of Foreign Red Clover Seed," Agr. Exp. Sta., Columbia, Mo., Cir. 166, Feb., 1928, B. M. King.

"Vegetable Growing in Missouri," Agr. Exp. Sta., Columbia, Mo., Cir. 167, Mch., 1928, J. T. Quinn and T. J. Talbert.

"The New England Seven," Ext. Serv., Agr. Exp. Sta., Durham, N. H., H. A. Rollins.

"Silage Crops in New York," Agr. Exp. Sta., Ithca, N. Y., Bul. 160, Dec., 1927, L. A. Dalton.

"County Agent Work in North Dakota," Agr. Ext. Div., Fargo, N. D., Cir. 83, Aug., 1928.

"Williston Substation Report for Apr. 1, 1927, to Mch. 31, 1928," Agr. Exp. Sta., Fargo, N. D., Bul. 219, May, 1928, E. G. Schollander.

"Cherry Pollination Studies," Agr. Exp. Sta., Wooster, Ohio, Bul. 422, July, 1928, J. S. Shoemaker.

"Training and Pruning Apple Trees," Agr. Exp. Sta., State College, Pa., Bul. 224, Apr., 1928, F. N. Fagan and R. D. Anthony.

"Experiments in Tomato Production," Agr. Exp. Sta., State College, Pa., Bul. 227, June, 1928, W. B. Mack.

"Better Oats for South Dakota," Agr. Exp. Sta., Brookings, S. D., Bul. 230, Apr., 1928, E. W. Hardies.

"Twentieth Annual Report of the Commissioner of Agriculture," Austin, Tex., Geo. B. Terrell.

American Potato Journal, The Potato Assn. of America, East Lansing, Mich., Vol. V, No. 7, July, 1928, and No. 8, Aug., 1928.

"High Grade Alfalfa," Bu. of Agr. Econ., Div. of Hay, Feed, and Seed, U. S. Dept. of Agric., Washington, D. C., May, 1928.

"Systems of Livestock Farming," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1546, Nov., 1927, M. A. Crosby and R. D. Jennings.

"Cucumber Growing," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1563, June, 1928, W. R. Beattie.

"Terracing Farm Lands," U. S. Dept. of Agr., Washington, D. C., Farmers' Bul. 1386, June, 1928, C. E. Ramser.

Economics

A new U. S. Department of Agriculture Circular 30, "Farm Management Extension, 1914-1924," written by H. M. Dixon, gives an interesting account of the development of farm management extension work during this 10-year period. It discloses the important steps which have been made to most effectively bring to the farmers of this country improved methods in agriculture.

Bulletin 7 of the Pennsylvania Department of Agriculture, as written by D. M. James of the Bureau of Markets, gives a statistical summary of carlots and loads of fruits and vegetables in 15 important cities in Pennsylvania. The data is given by months and shipments and are classified as to the state of origin.

"The McIntosh Apple on the New York Market," Agr. Exp. Sta., Amherst, Mass., Bul. 243, May, 1928, Lorian P. Jefferson.

"Potatoes in Massachusetts Farm Economy," Agr. Exp. Sta., Amherst, Mass., Ext. Leaflet 119, Mch., 1928, H. W. Yount, F. H. Branch, R. L. Mighell, and H. B. Rowe.

"Type-of-Farming Areas in Massachusetts," Agr. Exp. Sta., Amherst, Mass., Bul. 244, June, 1928, Ronald L. Mighell and Marian Brown.

"Social Organizations and Agencies in North Dakota," Agr. Exp. Sta., Fargo, N. D., Bul. 221, Aug., 1928, E. A. Willson.

Diseases

"Wilt and Blossom-End Rot of the Tomato," Agr. Exp. Sta., A. & M. College, Miss., Bul. 247, Dec., 1927, H. H. Wedgworth, D. C. Neal, and J. M. Wallace.

"Corn Root Rot Studies," Agr. Exp. Sta., Columbia, Mo., Research Bul. 113, Nov., 1927, B. B. Branstetter.

"The Black Rootrot Disease of Apple," Agr. Exp. Sta., Blacksburg, Va., Tech. Bul. 34, Mch., 1928, F. D. Fromme.

"Citrus Chlorosis as Affected by Irrigation and Fertilizer Treatments," Agr. Exp. Sta., Tucson, Ariz., Bul. 124, May 1, 1928, P. S. Burgess and G. G. Pohlman.

Seeding By Airplane

(*From Page* 19)

the opening during a given time. Flying at a velocity of 70 miles per hour at an elevation of 500 feet, the plane spread the seed uniformly on a 90-feet strip.

The corners of the tract were marked with white flags and white strips of paper were used as ground marks at 90-feet intervals across the tract to guide the pilot.

The land seeded was the typical rough, logged-off land of the Pacific Coast country which had been burned over. The development of this new and economic method of grass seeding, it is thought, will greatly stimulate the use of these lands for sheep and cattle grazing purposes. Such utilization of them will decrease the fire hazards on timber lands, it is thought, during the period of reforestation because such practices will keep down underbrush.

This is believed to be the biggest airplane seeding contract ever undertaken in the world, and the outcome is being watched by stockmen throughout the Pacific Coast area.

From Steam Engineer *to* Best Farmer

By G. R. Cobb

Salisbury, Maryland

SIXTEEN years ago John T. Reynolds, now living on a farm near Georgetown, Delaware, was "fooling with steam engines" and knew nothing else but this trade or profession. Today he is known as one of the best, if not the best, farmer in his district. It did not take John all of these 16 years to show his neighbors that he was to become the "best farmer" as he soon demonstrated that brain work was as important as brawn, even on a farm.

Handicapped by soil that had been farmed or rather "mined" for years, poor buildings, no knowledge of farming, and lack of equipment, Mr. Reynolds displayed a fine courage by starting this new venture. He was so ignorant of the farming game that to use his own words, "I couldn't even run a row," and the farmer who cannot run a row is held very lightly by his fellow craftsmen.

He Feeds Crops

On being pressed for a reason for his success, Mr. Reynolds made this answer, "I feed every crop." He might have added, "and I also feed my livestock," because his poultry, swine, mules, and other livestock show the effects of proper feeding and care. The County Agent vouches for the fact that the strain of Barred Plymouth Rocks developed by Mr. Reynolds are perhaps superior to any in his section of the country. And the Poland China hogs raised by Mr. Reynolds are known far and wide for their type, vigor, and size.

In writing a story of this kind, or rather in getting the facts, one is handicapped unless he has good eyes and reasoning power, because the successful farmer, like many other succesful men, has very little to say about his success. Thus it is necessary to talk with the County Agent, the neighbors, and others in order to get a fairly complete story. Mr. Reynolds does not feel that he has done anything remarkable.

We visited Mr. Reynolds just at corn harvesting time and was struck with the strong looking stalks and the yield of well-developed ears. On being asked why his corn was better than that of his neighbor's, he answered with one word, "potash." In addition to green manures, stable manure (when he can get it), and the regular application of commercial fertilizer, Mr. Reynolds uses 167 pounds of muriate of potash per acre on his corn crop, this extra application being the result of demonstrations carried on by him with the cooperation of his County Agent.

That this extra application of potash pays is well illustrated by the fact that the yield per acre is larger, the ears win first prize at corn shows and have a better keeping quality, and there is less shrinkage in storage.

Due to the fact that Mr. Reynolds is not a specialist, in that he stresses no one crop, one must know his method of farming and his type of rotations in order to fully appreciate his title of efficiency.

To illustrate—let us take a 14-acre field as an example and follow the rotation through one round. Starting with a crop of wheat in the ground during the fall and winter, we come to the harvesting of the wheat the following July, when 350 bushels were

secured from the 14 acres—a truly remarkable yield when one considers that Delaware is not known as a wheat-producing state.

After the wheat was harvested, the ground was prepared for clover and buckwheat. The buckwheat paid for the clover seed, fertilizer and labor, leaving the clover crop, either as seed or hay, clear profit. Following the clover crop was a crop of soybeans with a yield of 280 bushels on the 14 acres, for which Mr. Reynolds received $2.25 per bushel. Every third year a crop of corn is raised.

The yields obtained in 1926 and 1927 from these 14 acres were corn 1,490 bushels, wheat 350 bushels, buckwheat 300 bushels, soybeans 280 bushels, clover hay 33 tons, and according to Mr. Reynolds, the 14-acre "cut" netted him over $1,000 during the year, with a crop of wheat in the ground, extra.

As stated in the first part of this article, Mr. Reynolds "feeds every crop" and knows that potash is needed on his soil, and with his method of farming. Thus he uses stable manure reinforced by 400 pounds of superphosphate, plus about 200 pounds of muriate of potash per acre for his grain and hay crops. This amount is increased on potatoes and other so-called "truck crops." And following the best practice, Mr. Reynolds fertilizes his clover crop, which precedes the corn crop, with manure and phosphorus, using about 10 tons of manure and 400 pounds of superphosphate per acre. In addition to this the corn crop gets 200 pounds of potash in the form of muriate.

For soybeans, wheat, and buckwheat, Mr. Reynolds uses 500 pounds of a 2-8-5 commercial fertilizer supplemented by stable manure spread broadcast.

It would not be ethical nor fair to compare the ordinary farmer's methods and yields with those of Mr. Reynolds for obvious reasons, but to say that Mr. Reynolds is "far ahead of the rest of us" is simply repeating a remark made by one of his neighbors. And according to Mr. Reynolds, his success is due to the fact that he "feeds every crop."

More Fertilizer — More Cotton

By P. O. Davis

Alabama Agricultural Experiment Station, Auburn, Alabama

ALABAMA is making rapid progress in the efficient use of commercial fertilizers. It is a huge state demonstration in which the manufacturers of fertilizer as well as farmers are vitally concerned, and each group should profit by the application of the Alabama demonstration because it is based upon facts, accurately obtained by scientific research.

By the application of these facts, cotton production in Alabama is being revolutionized. A quarter of a century ago—and even 10 years ago—the production of a bale of cotton to the acre in Alabama was a rare event. Usually such yields attracted much comment among the people and afforded stories for the newspapers. People went to see and to study how it was done.

But such production in recent years has become an ordinary event. Throughout the state farmers and 4-H club boys in almost every community have produced a bale to the acre, and

some of them are exceeding this yield by 25 per cent, 50 per cent, and occasionally more. They are doing it not only on one acre but on fields of cotton.

However, not every farmer is making these high yields as shown by the fact that the average for the state for the last three years was under 200 pounds of lint cotton per acre. But the majority of those farmers and 4-H club boys who are using commercial fertilizer properly are producing around a bale of cotton to the acre, despite the presence of boll-weevils. Those who are failing to use it properly are pulling down the average. County agents do not hesitate to tell a farmer that if he will fertilize his cotton properly, plant good variety of seed, and then cultivate thoroughly, he may expect approximately a bale to the acre.

It is a significant fact that for the first time in more than 10 years Alabama was third among the states in cotton production in 1927. Only Texas and Mississippi exceeded Alabama.

And it was not an accident. The question arises: How did this happen? What forces are bringing about this change which is resulting in a new and more profitable production in one of the leading cotton producing states?

The Answer

The answer began 15 years ago when the Alabama Experiment Station, Auburn, began a systematic study of cotton fertilizers to get conclusive results. Experiments were not limited to one type of soil on the Experiment Station at Auburn, but the help of farmers was enlisted to make hundreds of tests throughout the State, thereby getting the facts about the effects of different fertilizers in each of the soil divisions.

To state it in other words: The Alabama Experiment Station went to cotton plants on the different soil divisions and asked them about their fertilizer needs. This included information about different ingredients and the ratio in which to combine them for best results.

Year after year that work has continued. It is still in progress. It is now more comprehensive than at any time in the past because new fertilizers have been placed on the market; and, as an unbiased-public-service institution, the Alabama Experiment Station is studying these in order to learn what cotton plants think about them.

Several years ago enough information had been gathered to enable the Experiment Station to make definite recommendations about fertilizers for cotton on each of the soil divisions of the state. These recommendations were based upon facts obtained by these experiments. The answers given by cotton plants were compiled and analyzed. Later research has strengthened these recommendations and furnished additional information for improving and enlarging. The fundamentals are the same.

About that time the extension service of the Alabama Polytechnic Institute began asserting itself as a powerful force in behalf of more profitable farming. An extension agronomist was employed who, in cooperation with county agents, launched a state-wide campaign for better fertilization of cotton. He went from county to county and from community to community within the counties using charts and figures and explaining to farmers their fertilizer needs as shown by answers given by cotton plants themselves. He insisted that in such matters the cotton plant was the final judge.

The specialist who did this was Frank E. Boyd. For several years Mr. Boyd conducted this crusade which was very convincing. County agents

(*Turn to Page* 61)

Pages From A Field Note Book

Club Boy Challenges Farmers

By Charles Kilpatrick

Fort Smith, Arkansas

WILLIAM SKORKOWSKY, Tishomingo, Oklahoma, Southeast district 4-H president, is not only a leader among his fellows, but he is a leader in "better farm and home practices." Cooperating closely with Curtis Floyd, County Agent, he lined up a number of demonstrations with fertilizers for Irish potatoes early last spring and he is challenging the state with the following results:

Plot	Size	Analysis	No. 1's	No. 2's	Yield per acre
1	¼ acre	Check Plot	292 bu.	23 bu.	315 bu.
2	¼ acre	300 lbs. 8-4-4	326 bu.	26 bu.	352 bu.
3	¼ acre	300 lbs. 8-4-6	353 bu.	25 bu.	378 bu.

The increased yield of marketable potatoes in plot three over check plot where no fertilizer was applied was 61 bushels. The fertilizer cost $8.10.

Young Skorkowsky follows out a crop rotation by plowing up alfalfa every five years. Realizing that his ground was rich, he planted 13 bushels of Nebraska certified seed in 30-inch rows per acre. He plowed and hoed his potatoes twice and was always

Left to right: William Skorkowsky, Jr., William Skorkowsky, Sr., and Charles Kilpatrick. The 61-bushel increase was obtained with $8.10 worth of fertilizer.

ready with poison for the bugs.

Besides the above demonstration, he conducted other tests with Irish potatoes for the County Agent, and he is conducting fertilizing demonstrations with corn.

William is working for a bankers' scholarship that is given to the outstanding boy in each district. He has an enviable record during his seven years of club work by serving as County 4-H president three years, winning a trip to American Royal at Kansas City for the best potato report. He won $23 in prizes on his potatoes at the recent Oklahoma State Potato Show. He has 22 hogs on hand at the present time, and from this demonstration he has cleared $1,000 during the past four years. He has financed his own way through high school besides helping his sister.

In all of his club work at home, it has been a fifty-fifty proposition between him and his father. This is his last year in club work, and for the past year he has been training other boys and girls to "carry on."

Pasture Improvement

(From the Report of the Director, Storrs Agricultural Experiment Station, Storrs, Connecticut, Bulletin 149)

THE nine four-acre plots were grazed by yearling steers in 1926 as in preceding years. Based on both the maintenance and the gains of the steers, the following increases in production have been obtained from the fertilizer treatments of 1924:

Plot Number	*Treatment	Increased production, above check plot, expressed in percentage			
		1924	1925	1926	Average
1	L P	33	150	184	122
2	P	39	69	83	64
3	L K	—5	28	27	17
4	K	0	14	—15	0
5ck	Nothing	..	..	..	..
6	L	—7	18	6	6
7	P K	45	123	135	101
8	L P K	28	184	198	137
9	N P K	99	125	113	112

*L—Ground limestone at 2,000 pounds per acre.
P—Acid phosphate at 500 pounds per acre.
K—Muriate of potash at 100 pounds per acre.
N—Nitrate of soda at 150 pounds per acre.

These results show that without phosphorus, no gains from other treatments may be expected. In 1926, acid phosphate alone nearly doubled the production; acid phosphate plus limestone or limestone and potash nearly trebled the pasturage; while neither potash nor lime alone or together, affected the yields appreciably. Thus it appears that phosphoric acid and lime are of prime importance in improving worn-out pasture land. White clover (T. repens) spreads rapidly over land treated with those plant nutrients.

Due to the fertilizer treatments on the experimental pasture plots, the

production has been increased until as many steers can be kept on two acres as were kept on four acres before treatment. For this reason and also because some treatments have been proven ineffective, certain changes were made in the spring of 1927. It was felt that these changes might answer some pertinent questions in pasture management without increasing greatly the cost of conducting the experiment. Therefore, four of the plots, namely, 1, 6, 8, and 9, were divided into equal halves and are being grazed separately to determine any difference in production between the halves. It is also planned to divide plot 4 and possibly plot 2 in 1928. If, after a few years of separate grazing, it appears feasible to use each half of these plots for different treatments, they may be used to answer such additional questions as how much lime, phosphoric acid, and nitrogen are profitable on pastures and also as to the rate of grazing and time of applying nitrogen carriers for best results.

Alfalfa Experiments

(From the Report of the Director, Storrs Agricultural Experiment Station, Storrs, Connecticut, Bulletin 149)

AFTER nine years, without any application of phosphorus carrying fertilizers, plots receiving potash alone yielded as much alfalfa in 1927 as those which had received 2,625 pounds of acid phosphate during this period. On manured plots potash has not increased the yields, but acid phosphate has produced a slightly larger crop. Nitrogenous fertilizers have not been profitable with alfalfa and tend to increase the amount of weeds and grasses in the stand.

On acid soil (pH 4.9) which had not been limed for at least fourteen years, ground limestone applied in April produced better stands of alfalfa than when applied in June, the alfalfa being seeded shortly after the June application of limestone.

Part of the land used in the "date and rate of liming experiment" had received liberal applications of a 4-8-10 fertilizer during the period 1915-1922, while the remainder had received the same amounts of a 4-8-0 mixture. No fertilizer has been applied since 1922. The limed plots extend across both of the above fertilizer treatments. Ground limestone at one ton per acre on the land treated with 4-8-10, produced a better stand of alfalfa than four tons of limestone on the land treated with 4-8-0. This indicates the necessity of using a complete mineral (LPK) treatment for alfalfa, rather than excessive amounts of one plant nutrient.

On land which had not received any potash or sulphur carrying materials for at least fourteen years, alfalfa did not respond to applications of sulphur in any of the following materials: Flowers of sulphur, gypsum, and acid phosphate. On the contrary, the four plots receiving potash produced the largest amounts of alfalfa.

ALFALFA ROUTS CANADA THISTLES

Alfalfa is the best cure for the Canada thistle, says A. L. Stone, Wisconsin weed commissioner. He says the thistles must be partly subdued before the alfalfa seed is sown and the soil and other conditions favorable.

Farm Demonstrations

(*From Page 8*)

fertilizers was 133.3 bushels.

Potatoes are a crop well adapted to peat and sandy peat and good yields and excellent quality can be obtained with proper fertilizers. Four plots harvested on sandy peat gave the following results: Average yield of four check plots, 59.3 bushels; Yield of one potash plot, 70.2 bushels; and average yield of four potash and phosphate plots, 121.6 bushels.

Alfalfa Builds Fertility

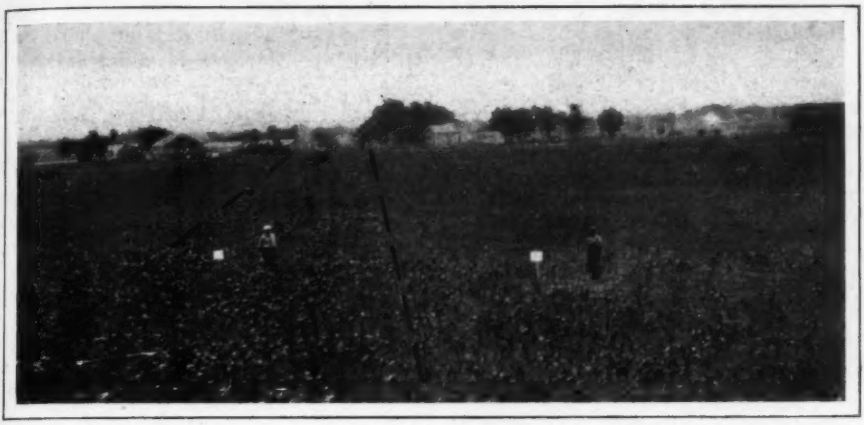
"The fertility of all of our sandy farms is lower than that indicated on the virgin soil and many farms are at or approach the worn-out condition," explains Zeasman. "The logical method of development is to add the mineral fertilizers and lime and grow legume hays to build up the nitrogen and organic matter. The logical method of attack is through alfalfa, which is rapidly gaining in popularity.

"The short-sighted policy in the alfalfa campaign in the sand region was advocating manure for alfalfa. It is true that good stands and yields can be obtained with manure, but non-legume crops need the manure on the sand farms so badly that it is an uneconomic use of the nitrogen of the limited manure supply to use it on alfalfa.

"The use of potash and phosphates, as commercial fertilizers, in addition to the lime is the most economic practice on these farms, and most of the extension effort in the sand territory is given to this problem.

"In a summary of 35 cuttings made on alfalfa plots in 1927 about three-fourths of the plots show a bigger increase from potash alone than from phosphate alone. An occasional plot shows better response to phosphate. Nearly always the combination of both shows the largest increase. A single cutting pays for the fertilizer. When it is considered that a similar increase carries through four to six cuttings, a profit of from 300 to 500 per cent can be realized on the money invested in fertilizers. Similar results are possible with clover on sand.

The row of cabbage in the foreground on this dark, fine sandy loam received no fertilizer. All the other plants were fertilized with from 200-300 lbs. per acre of 0-12-12.



On the potash strip the corn is over knee high. The balance of the field is only half as tall, and the stand is poor.

"We feel that commercial fertilizers on sand for corn are a makeshift to be used only when corn must be grown on poor land or land robbed by a heavy feeding crop," Zeasman points out, "but the practice is not nearly as profitable in permanent agriculture as fertilizing the legume hay crop and using manure for corn. Since the agricultural committee in Adams county had arranged with farmers for fertilizer demonstrations on corn, we decided to start the plots with the idea of getting yields on the legumes the following year. We feel that in the sandy soil region the emphasis ought to be placed on potash and phosphate for the alfalfa and clover and manure for corn.

"One very striking result was obtained on corn on fine sandy loam to loam soil. This field is on a small farm on which comparatively intensive methods are used. The field had been in alfalfa two years. It was surface-dressed with manure on the nurse crop stubble and again the next fall. The alfalfa sod was plowed in the fall

The potash strip tasseled a week earlier than the balance of the field.

of 1926. The average farmer would have said that here was a field fertile enough to grow a first class crop of corn.

"The owner, however, was at one of the soil improvement meetings and decided to use 250 pounds of superphosphate on the entire field. He also put on a strip of potash in addition to the phosphate. He used about 150 pounds muriate of potash per acre. (The strip is shown between the black lines on the two accompanying pictures.)

"The potash strip was far ahead of the balance of the field and attracted much attention all season. The yield of corn was 66.3 bushels per acre on the potash and phosphate combination and only 31.7 bushels per acre on the portion not receiving the potash. After the corn harvest the owner remarked: 'I have learned a valuable lesson and I am ordering 2,600 pounds of potash and a ton of phosphate for next year.' "

A Grad Makes Good

(*From Page* 44)

was well over 300 bushels per acre, however. Nine-tenths of the crop were sold in the fall at digging time at an average price of $1.40 per bushel.

In 1928 the average again was 300 bushels per acre and the average price was about $1.00 per bushel. The sweet corn brought in additional revenue as it was an excellent year with high prices for this crop.

Some of Frank's operations are of decided importance and show why he has been successful. The plowing has always been from 8 to 9 inches deep and if possible the land has been harrowed previous to plowing. Following the harrowing the land has been smoothed or leveled with a plank drag. A modern two-man potato planter has been used in which all the fertilizer has been distributed in the drill with the seed piece.

After planting the fields have been leveled with a drag or spike tooth harrow and this has been followed with a weeder in order to stop the growth of small weeds at a time when they are most easily killed. As soon as the rows of potatoes were seen, a riding cultivator was used, the potatoes being gone over twice. Then hilling started, not the high hills used by Maine potato growers, but a broad, low, flat top hill was drawn up when necessary to cover and kill weeds. On the first appearance of the Colorado potato beetle the plants were sprayed with calcium arsenate and thus the pests were destroyed before great damage resulted. Spraying with Bordeaux mixture started each year between July 1 and 5 and continued until September 10, in some of the years once in every 10 days. During the years when lice were common one quart of nicotine sulphate was used with 100 gallons of Bordeaux in order to check this pest.

When the vines were all dead, the potatoes were dug; they were graded with the best type of grader; and generally marketed direct from the field, although in late years a tendency to store has been indicated.

Frank expected certain work from his team, from the men employed and from himself. He expected a three-horse team to plow an acre in five hours or two acres a day. A Fordson tractor should harrow thoroughly two acres in an hour. He expected a three-horse team drawing a 12-foot drag to harrow two acres per hour.

He expected a two-man planter to plant at least 3½ acres in nine hours. He expected a twelve-foot weeder drawn by two horses to cover three acres per hour. He expected a riding cultivator to cultivate an acre in 1½ to 1¾ hours. He expected his best sprayer to spray an acre in 1¾ hours, this to include filling as well as applying the mixture.

He feels that a good picking gang, that is, the group that pick up the potatoes after digging, should average from 90 to 100 bushels per day per man. This includes those that are digging and grading as well as those that are picking up. He feels that four men with a Boggs hand grader should grade 700 bushels in a day. He feels that a truck should be able to deliver 300 bushels in a nine-hour day on a seven-mile haul each way, taking 65 bushels per load. He feels that fertilizer can be home-mixed at a labor cost not to exceed $1.50 per ton. He feels that the average cost per acre for producing including all costs involved has never been much under $200 per acre.

He has found that he never has any trouble getting all the help that he needs, even those that pick up potatoes. In his words—"A few kind words and lots of soft drinks, pumpkin pie, and a cash bonus for staying faithfully through the season accomplishes wonders, lots more than any amount of nagging and howling." He further feels that—"I owe much of my success to parental cooperation and advice. I advise every young man who has a father who has been an active, successful farmer to profit from the advice and experience of his parent. At the same time I feel I must know when to follow new methods or new conditions."

Not only has Frank Williams had time to carry on these wonderful farm operations, but he has been able to give much of his time to community life—to the church, clubs, and community betterment in various ways. In his words—"Farming pays fair returns if well planned, if you work hard, and deal on the square."

Business Interpretation

(*From Page 26*)

1926; not the cost paid the men but the real cost of labor, which included wood, milk, use of house, etc. Horse labor is charged at cost, 13.2 cents per horse hour.

Dickey points out that the time required for baling and hauling hay, barn storage room, and fire insurance are directly in proportion to the crop grown. These are charged at the average cost per ton for 1926. The charge for hay storage is low. The use of fertilizers on this farm has made it necessary to build more barns. The extra time of cutting, tending, and raking the larger crop and additional use of machinery has not been counted. The time to load and haul to the barn is estimated from the time for the total crop, but is very close to correct. The farm is three miles from the railroad and has some bad hills but over 2 tons of baled hay is hauled per load. No hay loader is used, but otherwise work is economized. The charge for baling of $1.25 per ton is not counted, as this is deducted from the price when selling.

In most years, the increase of 60 tons of hay from this farm will sell for $900. This would allow a profit of $265 from fertilizing, not a profit of $628 that would be indicated by usual methods of figuring.

Fixed costs should include fertilizer,

freight on fertilizer, mixing and applying fertilizer, and interest on these, in this case, $365.25.

"Costs, directly proportional to crop are hauling in, storage, fire insurance, baling, hauling to market, interest on these—$269.41 or $4.49 per ton.

"It can then be determined, approximately, what increases and prices are necessary for profit on this farm. If the increase is half a ton per acre from the treatment, the fixed costs are $365 and the variable costs $135. The 30 tons of hay, on this basis, would have to bring $16.66 per ton to pay the cost. This would not be a very attractive investment with hay at less than $18 to $20.

"In some extra good years, this treatment on this farm may give an increase of 1½ tons per acre. The fixed costs would then be $365 and the variable cost $404. The cost of the 90 tons of hay would be $8.55 per ton.

"It is found that the increased crop costs approximately $16.83 per ton if the increase is one-half ton, $10.58 per ton if the increase is one ton, and $8.55 if the increase is one and one-half tons. The average cost of growing hay in this region is $6 per ton. These results may suggest why farmers are slow to take up the fertilizing of hay," Dickey concludes.

He states that these results are, of course, given to show a method of business interpretation of the use of fertilizer and not to give a discussion of fertilizing hay.

New Hampshire

(*From Page* 12)

State has shown that nearly one half of the potatoes marketed in New Hampshire are shipped in during the competing season when local grown potatoes are sold. The survey is being followed up by studies of the cost of production of potatoes and great variations in labor costs have already been found. Growers handling over 11 acres, for example, were found producing the crop up to market time at a labor cost of 71.6 hours per acre, whereas producers with less than three acres in the same section required 131 hours. A large part of the potato crop of the state has been produced on small areas with a noticeable lack of adequate machinery for planting and digging.

Some of the accomplishments which the New Hampshire station can fairly claim during recent years are as follows:

Development of a definite orchard program, which it is estimated would mean an annual increase of $350,000 in the apple crop if applied to a fourth of the bearing trees of the state;

Proof of the possibilities of alfalfa, soybeans, and other legumes, and initiation of the campaign for their use in the dairy ration to cut down the farm grain bill;

Variety tests with field corn, oats, field beans, soybeans, wheat, root crops, forage crops, apples, peaches, plums, cherries, strawberries, raspberries, peas, and tomatoes to determine the kinds best suited to New Hampshire conditions;

Creation of special strains such as "New Hampshire 500" ensilage corn, which on certain types of soil has outclassed other varieties; the Granite State cucumber; and improved timothy;

Original tests of certified seed potatoes, which have meant an annual average increase of 65 bushels per acre over common stock in countless field demonstrations;

Alfalfa on the soil fertility plots established at Greenland, N. H., by the New Hampshire Agricultural Experiment Station.

Perfection of control measures for such devastating pests and diseases as late blight on potatoes, apple scab, codling moth, apple maggot, brown-tail moth, etc., three of which it is estimated do an annual damage of $215,000 in the state;

Institution of the campaign against white diarrhea of chickens which is actually eradicating a disease that a few years ago was destroying 50 per cent of the chickens hatched within our borders;

Development of New Hampshire grown certified seed potatoes; and

Maintenance of the analysis service which tests feeding stuffs, fertilizers and seeds, thus making it possible for the State Department of Agriculture to prevent the sale of materials which are fraudulently misrepresented or which have no value.

Stealing Northern Honors

(*From Page* 18)

am very careful in cutting my seed pieces, to make them thick and block-shaped, and weighing from 1½ to 2 ounces each. They are put in the row at a distance of from 11 to 14 inches apart. A 44-inch row is the ideal row in my opinion, for our section. Care should be exercised in not planting potatoes too deep. Five inches of loose dirt over the potato piece is ample.

"Another important step in potato culture is cultivation. It is folly to assert that potatoes should not be cultivated. I try to cultivate at least twice. When they are five to seven inches high I cultivate rather deep, at a distance of from three to six inches from the stalk. The soil is thoroughly loosened with a spring or rigid tooth harrow and then brought back with a turn plow or a disk cultivator. The second cultivation is done in the same manner, except that it is

done at a greater distance from the stalk and not quite as deep as the first. I find it advisable to run a double mould board plow or middle breaker between each row a few weeks before harvesting, as it tends to kill and destroy much weeds and grass.

"I manage to harvest, grade, pack, and load on cars in quick succession. The potato digger is followed by a crew of boys and girls, who gather the potatoes in bushel boxes. The boxes are then carried in carts to the grader, which is usually located near the potato patch, and from the grader the potatoes are put into sacks. The sacks are then weighed and sewed and immediately loaded on a truck, which conveys them to freight cars for shipment. In some cases, less than 25 minutes elapses from the time the potatoes are dug and placed in cars for shipment. It will be noted that the potatoes are handled very little.

"My potato crop was delayed about two weeks this year, due to a cold snap which actually cut down about 60 per cent of the stalks of the plants. In some instances the stalks were cut to the ground. Owing to the delay, I did not get very high prices. My average was $1.66 per 100 pounds."

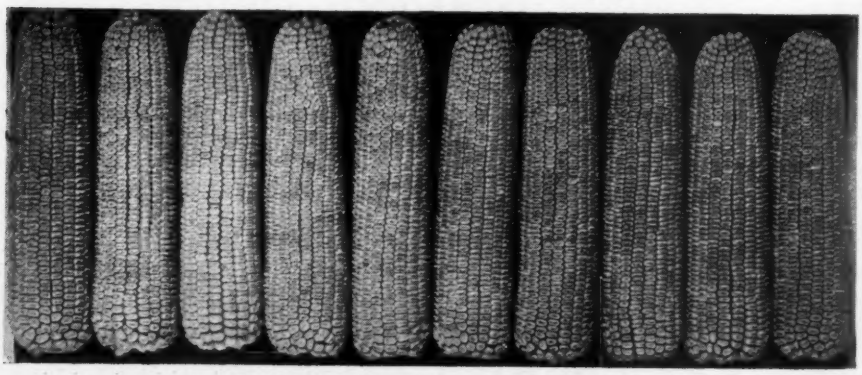
The Annual Crop Show

(*From Page* 28)

a variety has no influence upon the yield of the progeny. That is to say that the score card for corn is no criterion for the measurement of the productivity of corn. It does evaluate some of the characters pertaining to maturity and market condition of corn which are valuable; but it does not evaluate any of the hereditable characters as to yield.

Richey, of the United States Department of Agriculture, says, "winning in a corn show should be taken for what it is, namely, evidence of ability to grow corn and patience to select a good sample." The score card of performance should become a full partner with the score card of appearance. Under performance the following questions should be answered satisfactorily:

1. Is it a pure variety?
2. Is it free from disease?
3. Is it adapted to your soils and climate?
4. Will it yield?



A winning sample—not perfect, but try and pick out 10 ears like these.

More Fertilizer—More Cotton

(*From Page 50*)

"carried-on" in cooperation with him and have continued to promote the doctrine of better fertilization because it has proven itself time and time again.

According to the Auburn recommendations, application of all the superphosphate, all the potash, and one-fourth of the nitrogen at the time of planting is recommended. The remaining three-fourths of the nitrogen is to be applied immediately after cotton is chopped.

Prof. M. J. Funchess, director of the Alabama Experiment Station, says that while nitrogen is the key-element, phosphate and potash should not be neglected. In fact he places emphasis on these elements because the best results from nitrogen are dependent upon an adequate supply of phosphate and potash.

Dry Land Farming

(*From Page 16*)

residual effect is apparent for three years or more. Present experiences on these farms are that where legumes and wheat are grown in rotation each crop should occupy the ground about half of the time.

Farmers in the Palouse country have found that the wheat crop after sweet clover will produce a 42-bushel yield, while their wheat grown under exact conditions on well handled summer fallow yields 45 bushels. In general, wheat yields after legumes are not quite as high as on the best handled summer fallow, but higher than on some of the summer fallow, and considering the fact that the use of the land was not lost, the values lie in favor of the rotation with the leguminous crop.

In Oregon under somewhat similar conditions on large wheat farms in Umatilla county, nitrate fertilizers have been added to land farmed under the summer fallow method. Increases in yield of more than 100 per cent have been obtained on limited acreages from the use of 150 pounds of nitrate fertilizer. The plan here is to eliminate the necessity of summer fallowing every second year for the accumulation of nitrates. Owing to weed conditions, it will doubtless be necessary to fallow every third or fourth year to clear the land, however. These results in Umatilla county check somewhat with results in the Palouse country. There, field results showed that applications of 15 to 20 pounds if nitrogen increased the yield on late fallow 13 bushels and brought the production up to where it equalled that on properly handled summer fallow.

BACK TO THE SOAP-BOX

Two colored men down in Southern Indiana were bewailing the hard times being felt in the agricultural district there. "Times is tighter than I ever seen them before," said one. "I can't even get hold of a nickel! If something don't turn up I'm going to start preaching. I done that once and I ain't too good to do it again."—*Echo.*

A Floating Fertilizer Factory

FRANCE owns what is stated to be the largest floating fertilizer factory in the world. The ship, which is to fish on the Newfoundland coast, is equipped with fish decapitating and gutting machinery that can handle hourly 1,000 to 1,200 large fish. The waste products are worked up into fish meal and 8 tons of raw material can be made into 2 tons of fish meal per 24 hours. In addition there is a plant to extract oil from the fish livers. The displacement of the vessel is 1,540 tons, its length over 200 feet. It is driven by a triple-expansion engine of 850 H.P. and in a trial run attained a speed of 11.5 knots. The total crew is about 50. The construction of the ship complies with the most rigid requirements of the "Veritas" Bureau for vessels having to resist ice pressure.

Indian Summer

(*From Page* 4)

this friendly old scene again, I clambered down out of my "twin sicks" and quite promptly invested a dollar in a clog dance, a cracked version of Dear Nelly Gray, two bottles of furniture polish, and a cake of scalp destroyer.

Although I did not take my package home to my thrifty wife, I felt much the happier for my purchase, because it rolled back the years once more and cleared some of the mists away from almost forgotten autumns. I gave the vagrant vendor a dollar and got only a few scents, but it was worth it.

'Tis also the hunting season. Here, too, the times have changed, and the red tape and license business have wellnigh taken the zip out of the sport for those who listened to Grandfather's tales of the wildwoods or perhaps partook a little of the selfsame freedom.

First of all in greatest abundance were the pigeons. My father told how they came so thickly that the sun was darkened by their flights. They were mischievous and fed freely upon the grain so that the rifles, shotguns, and flintlocks were furbished up and the days were spent in pigeon killing.

A little later in the season when the corn was ripe and the treetops were sending down showers of acorns, chestnuts, and beechnuts, squirrel hunting became a rural pastime. Red, black, and gray squirrels were so numerous of old that they devastated the cornfields. They stripped the husks from the ears and ate the kernels, or carried them off to their nests. The farm folks in those days had little corn to spare from the small clearings, and so the men started out in defense of their possessions. It was a sport that required more skill than pigeon shooting. He who aspired to be a local nimrod would scorn the shotgun when chasing the squirrel army. The rifle was the weapon chosen in honor of the chase and to develop steady marksmanship.

A hunt still more exciting and perhaps less useful was when the boys decided to tree a coon somewhere in the deep woods and do him bodily harm. Here also it was often a question of coon or corn, and the pioneers quickly decided. When the hard day's work was over and the silver moon was climbing into the sky, a band of youngsters would gather at some appointed spot and with guns, coon dogs, and axes, strike out across

the fields and down into the marshes.

After the luckless coon was taken either by shot or treefall, the boys were not content to march homeward. Scrap-wood from the forest, or even fence rails at times, were eagerly hauled together and set afire. Roasting ears were stripped from a near-by cornfield without leave or license, and in fact a party of bedlamites like this did more damage than the whole family of raccoons themselves.

'TIS also the time of the harvest moon, the gathering and garnering—corn husking in the North and black hands reaching for the bursting bolls in Dixie. The fall furrow opens, the crows hold their caucus, and the turkeys come homeward to the fattening coops.

Provident husbandmen rejoice at *individual plenty* and the college economist sharpens his pencils to prove another woeful *collective surplus.*

Furnace fires are kindled in the towns to drive out the clammy mustiness. The base burners are hauled back to their places on the ornamental zincs in the country living rooms with the usual subdued curses of a godly sire struggling with sooty hands to make rusty stove pipes come to a joint understanding; bats, swallows, and streaky creosote in the chimney; drafts and stifling smoke.

With us Northerners it is a season of preparedness, a general refunding of finances to meet the shock of a long, cold siege. Where in this case is the protesting voice of the pacifist to rail against this marshalling of resources? He has probably gone to California, according to his means and ability, either by box car or cabin airplane. He has left us to thaw frosted fingers around our campfires, and presently he will mail us a post-card of himself basking on the beaches.

Self-sufficing agriculture in the technical sense may be obsolete, but at this period of the year we see many evidences of snug independence. Farm folks may not spin yarn or pour tallow into molds, mend shoes or fashion dishes out of wood, but they still adhere to the central theme of family life. The significance that lies in the conical woodpile and the rows of canned goods on cellar shelves is never more apparent than it is now.

It means that farming is more than harvesting and hoping, more than counting cash and talking pedigrees. It means that after all the ultimate good in any satisfactory way of life lies in the security of the home and the reasonable comfort of its inhabitants. Although the household is a twelve-month institution, the nearness and dearness of its spirituality become more potent and poignant when the last leaves fall to a frozen ground.

Sadness and craven fear seldom grip the mind of a healthy mortal with gainful occupation as the year wanes. Of course there is always an exception made for the unfortunate. But all other things being equal, there should be enough of the ancient faith in us to withstand the deadening dread, for after all blue jays are still at our door waiting for another season. Trees have started a new crop of buds, and there is June buried in the grass roots.

'TIS likewise the time when the conservative has his innings both in politics and economics. The grand old party of my state, which stands pat on the theory of the steady pay check and the full lunch box, usually goes to bat after a bountiful harvest and elects its favorite son. It has happened thus, often because the great electorate knows that winter is just around the corner! It is easy to vote for extreme liberal ideals when sap runs and the birds sing, but the ardor of the enthusiast is tempered by the advent of cold nights and short change. This effect of Indian summer campaigns upon the history of America is written large and bold. To correct it we must either change the seasons or tack

on another amendment somewhere. Take your choice!

Economic and civic history gives many examples like the May Day riots and the storming of the Bastile in July, but there are few such manifestations of super-heated mass psychology when the chill of October is in the air. Most of these revolutionary changes await the turn of the year and require the imminence of Old Sol and his fiery rays to kindle their resolve. This is probably because man's energies are taxed to keep merely what he *has* secure against the long season of inclemency without borrowing trouble elsewhere. So the fervid radical merely stacks his arms and does not surrender to his traditional foes, conformity and conservatism. He may read Karl Marx and the Appeal to Reason this winter, but the storm windows must go on first!

My wife's kitchen economy brings me the final blessing of the harvest term, and adds something by the way besides vitamins to my supply of wealth and welfare. Throughout the more abundant seasons she has been culling, cooking, and canning, and now I have brought up the pumpkins for pie stock, the fall pippins for making apple butter, and the purple Concords to give us jam and juice.

What a waste would have ensued after all my enthusiastic culture had she not wielded the skimmer and the wooden spoon! What an aching void for our family this winter had she preferred Eleanor Glyn to Fanny Farmer!

Yet the infinite meaning in this bustling pre-occupation of hers lies not entirely in the spicy aroma and the mouth-watering edibles whose enjoyment must be deferred. I have noticed that the aim of her art is to select the very best, to cook it well, and to seal it sweet. Selection, preparation, and preservation—these three elements of success in fall canning—I have taken safely to heart.

They say good intentions make great *paving* materials in certain nether regions. But I say that good intentions make splendid *canning* materials, and if the selfsame reasonable precautions and foresight be applied to them as go to the preservation of food, we shall have no trace of mental ptomaine!

AND so I know of no better way to end that to forbear from quoting autumnal poetry of my own or somebody else's manufacture. The last drop has been squeezed from one of the most abundant growing seasons known to the oldest inhabitant, and if we cannot preserve and conserve some of this bottled sunshine to last us during the long and trying weeks of red noses and boiled dinners, it is our own funeral.

The Indian prophet who spent the summer selling fakes to foolish tourists points now to the rich fur of the muskrat and the thick bark on the hickory and advises us to order a few more blankets. That is perhaps the meanest trick which our Indian does to us, and we feel like voting to have his name removed from the title of this pleasant interval.

But I shall buy a snow shovel and a few new books, take the ice card out of the window, and dive right out unafraid into the first November blizzard. In the meantime I shall enjoy, as I always do, every day of Indian Summer.

The same to you!

RESTAURANT SLANG

"Scrambled eggs," ordered a customer in a city market restaurant.

"Milk toast," murmured his companion, who was not feeling well.

"Scramble two and a graveyard stew," sang the waitress with the titian hair.

"Here," corrected the second man, "I want milk toast."

"You'll get it buddy," replied the girl. "That's what they call milk toast in Chicago where I was working."

The two customers held a conference and decided to "put one over" on the "fresh young thing" from Chicago. The first one wanted a glass of milk and the second one a cup of black coffee.

When the girl appeared to put a "set up" of the restaurant artillery in front of the men, the second man gave the following order:

"A bottle of lacteal fluid for my friend and a scuttle of Java with no sea foam for me."

"Chalk one and a dipper of ink," shouted the girl. She didn't even smile.—*Typo Graphic.*

A Los Angeles patrolman had brought in a negro woman somewhat the worse for wear, and the desk sergeant, with his very best scowl, roared:

"Liza, you've been brought in for intoxication."

"Dat's fine," beamed Liza. "Boy, you can start right now!".

OMIT THE MIDDLEMAN

A colored man went to his pastor and handed him a letter to the Lord, which ran: "Please send dis poor darkey $50 right away." The pastor, a kindhearted man, called together several of his friends and said: "This poor fellow has so much faith in the Lord that he expects Him to send the $50 right away. We shouldn't let him be disappointed. Let's make a collection for him." This was done and $42 was contributed, which sum was sent to the ingenious petitioner.

Next day the colored man handed the parson another letter. This one ran: "Dear Lord, de nex' time You send dis darkey money, don't send it through no parson—send it to me direct."—*The Enamelist.*

Slicker: "Nice corn crop you have there."

Native: "Yeh, about thirty-five gallons to the acre."—*Carnegie Tech Puppet.*

Mary had a little dress,
A dainty bit and airy;
It didn't show the dirt a bit,
But, gosh! how it showed Mary!
—*Oral Hygiene.*

Voice on the Telephone—"My son will not be able to come to school this afternoon; he has a cold."

Teacher—"Very well, sir. Who is speaking?"

Voice—"My father, sir."

PROFIT OR LOSS

WHICH?

THERE is a big crop of potatoes this Fall, and prices are low. The growers who are realizing a profit under present conditions are those who kept their potato plants on the job by keeping them well-fed and healthy.

The left photograph shows a healthy potato plant with the strong, sturdy, upright stems, and smooth, even-colored leaves obtained when potatoes are fertilized with a complete fertilizer containing nitrogen, phosphorus, and potash. This is the type of plant that pays the farmer a good margin of profit.

The right photograph shows a potato plant grown on a soil deficient in potash, although abundantly fertilized with nitrogen and phosphorus. The plant is stunted, the leaves are crinkled, and the petioles shortened. The leaves, deep green at first, later become bronze in color. The entire plant may collapse. Farmers who produce plants of this type suffer big losses.

Don't let potato plants become so starved for potash as to develop these hunger signs. Field demonstrations have shown that complete fertilizers containing 80 to 100 pounds, of actual potash per acre bring good results. On this basis, at least 1,000 pounds per acre of a high analysis, complete fertilizer, containing 8% to 10% potash, or 2,000 pounds per acre, if the potash content is 5%, are required for profitable returns. Where from 8 to 10 tons of manure are used per acre, the above rate of application can be reduced one-third.

Send for your free copy of our new booklet, "Better Potatoes"

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY.

of Amsterdam, Holland

19 West 44th St. NEW YORK	Hurt Building ATLANTA	Lampton Bldg. JACKSON, MISS.
McCormick Bldg. CHICAGO	First Nat'l Bank Bldg. BALTIMORE	Bank of San Jose Bldg. SAN JOSE

POTASH PAYS · POTASH PAYS · POTASH PAYS · POTASH PAYS